

35-mm PHOTOGRAPHY

14267
SUMMER 1976
\$1.95

By the Editors of Popular Photography

Beginning in
this issue:

THE COLOR PRINTER'S BIBLE

A 22-Page Special
Guide to the Craft
of Color Printing

THE NAKED TRUTH ABOUT NUDE PHOTOGRAPHY

Step-by-step:
MAKE
YOUR OWN
CARBON PRINTS

CLOSETS THAT
BECAME GREAT
DARKROOMS

JUST WHAT IS
VISUAL LITERACY?

PROJECT B&W
PHOTOGRAPHS?

How to Make
Top-Quality
Copy Slides





Canon EF with FD 50 mm f:1.4 SSC

Total control. In any light.

The Canon EF may very well be the best-conceived and executed fully automatic professional single-lens reflex camera available today. Its shutter is *both* electronic and mechanical. It's electronically timed for stepped speeds from 30 seconds to 1 second, and mechanically timed from 1/2 second up to 1/1,000

sec. So, should you be caught without batteries, you still have complete use of the most important shutter speeds.

Automation is shutter-preferred. Because when the action's frenzied, you can't take the time to check your shutter speed to see if it's fast enough to prevent blurred pictures.

The metering cell is silicon, because silicon is more sensitive in low light than CdS. As a result, the possibilities for outstanding photographs are greatly expanded—you can literally shoot in any light, any time, any place. It's also more responsive to fast changes in lighting—something an auto camera should be able to deal with without delay.

The EF accepts all Canon FD lenses for fully automatic operation, and FL lenses for metering via the stop-down method—plus a host of Canon accessories. The EF is a remarkable achievement. Best of all, it's available right now.



Canon TX with FD 50mm f:1.8 SC

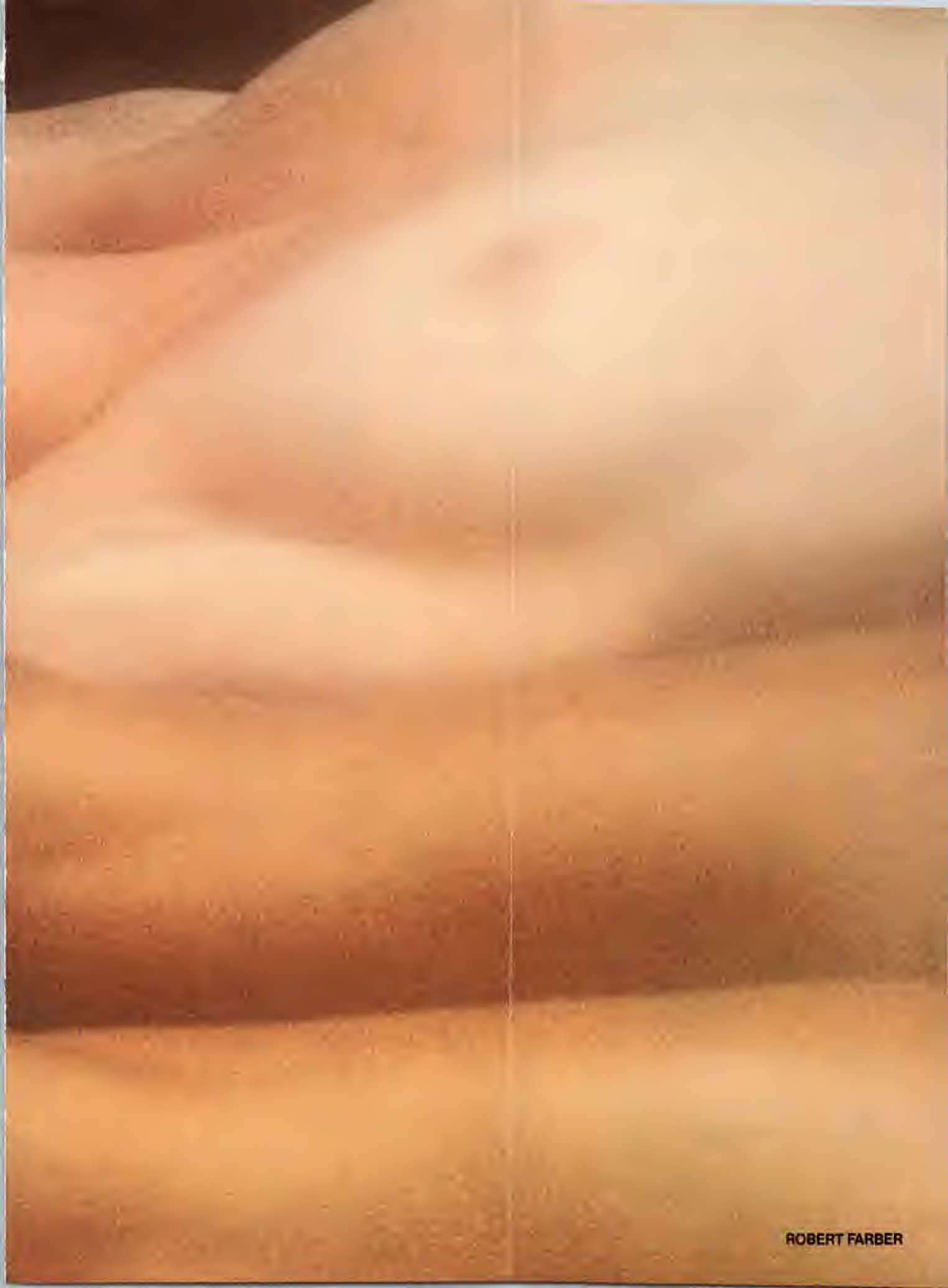
A Canon you can start with. And stay with.

If you're anxious to get started in fine photography, but don't know in which direction or how far you'll go, the TX is the perfect Canon for you. It has the precision and versatility that Canon SLR's are famous for, yet

represents a small initial investment, compared to the kind of photographic returns it can give.

Basic features? It has them all, with sensitive, through-the-lens full-aperture metering (center weighted), shutter speeds from 1/500 to 1 sec., easy loading with special multi-slotted take up spool and a built-in flash hot shoe. And it accepts all of the nearly forty Canon interchangeable lenses used by its siblings, and most of the same accessories for close-ups, macrophotography and photomicrography.

If you're already into the Canon SLR system, the TX makes a great second camera body. If you're just getting started, it's a ticket to the kind of pictures you've always wanted. And, it's a camera that can get you Canon quality—the kind of quality you really want—at a price that means you don't have to settle for second-best.





Canon F-1 with FD 50mm f:1.4 SSC

The final step upward.

There are people who earn their living by photography. And others who could if they wanted to.

For these, Canon created the F-1 system, with nearly 40 lenses (our FD series—from 7.5mm to 1200mm) and 200 accessories to meet almost any photographic demand. A system so complete that if the human eye can see a subject, the camera can take a picture of it.

Added to that is a choice of shutter speeds up to 1/2000th of a second and a spot metering system that concentrates 100% of its measurement on the central 12% of the viewing screen.

What's more the meter is an integral part of the camera body itself. So you can use any of the interchangeable viewfinders without losing the meter.

Even low light is no problem. The Booster T Finder extends the built-in meter's capabilities to give accurate readings in light from dim to near-black. As for unpredictable lighting situations the Servo EE Finder automatically adjusts aperture so you can photograph anything from a rocket launch, where correct exposure is impossible to anticipate, to sports events, where light conditions can change abruptly.

With all parts machined to a tolerance of 0.1 micron, the Canon F-1 is a camera system built to endure the stresses of heat, cold, humidity and time. One reason why it's fast becoming the standard of professional photographers throughout the world.



Canon FTb with FD 50mm f:1.4 SSC

For life's realities.

Granted, the F-1 is the ideal. But what if you're a photographer who'll never need a motor drive. Never use the Servo EE. Do you have to settle for less of

a camera? By no means.

Since it accepts all FD and FL series lenses, the FTb gives you the same lens interchangeability as the F-1. It gives you the same CAT automatic synchronized flash control. Even the same through-the-lens spot metering system with all metering information shown in the viewfinder. And shutter speeds up to a fast 1/1000 of a second.

The FTb also possesses the advantage of Canon's exclusive QL quick loading film mechanism.

As for accessories, there is a complete range. From a special FTb Booster Finder to bellows, extension tubes, angle finders and magnifier, to name a few.

With the Canon FTb, you don't sacrifice quality. You don't sacrifice anything except some accessories you might be able to do without.

The *best* Canon is the Canon that's best for *you*.



Canon®

Canon USA, Inc., 10 Nevada Drive, Lake Success, New York 11040
Canon USA, Inc., 140 Industrial Drive, Elmhurst, Illinois 60126
Canon USA, Inc., 123 Paulmar Avenue East, Costa Mesa, California 92626
Canon USA, Inc., Bldg. B-2, 1050 Ala Moana Blvd., Honolulu, Hawaii 96814
Canon Optics & Business Machines Canada, Ltd., Ontario

Metz announces studio lighting that fits in a shoe.

Slip the new Metz Quadrolight® into your camera's accessory shoe, and you have a roomful of lighting effects at your fingertips—with automatic exposure control.

The Metz Quadrolight®, with its unique swivel head, enables you to bounce the flash off the ceiling as well as off the walls to either side. It's ideal for soft-lighting portraits and children, also for illuminating large areas when taking wide angle shots. The Metz Telecomputer assures correct exposure for any of 3 lens apertures. You also enjoy battery-stretching thyristor circuitry, three-hour recharging, and powerful light output plus reliable Metz performance. See and try it at your dealer. Ehrenreich Photo-Optical Industries, Inc., Garden City, New York 11530. 

Metz Quadrolight 4-way bounce flash



35-MM PHOTOGRAPHY SUMMER 1976



Photo

STINE



Photo



Photo

- 4 Letters to the Editor
- 6 What is Visual Literacy? by *Ralph Hattersley*
Our resident philosopher tries to pin down an elusive term that has become the most overused catchphrase in photography
- 20 Closet Darkrooms by *Lester Lefkowitz*
When the cost of photography takes the shirt off your back, here's one place to find cheap extra space
- 26 Naked Truth by *Alice Williams*
What is it like to photograph a nude? To pose nude? What is nude photography all about? We look through both ends of the lens and tell all!
- 36 B&W Slides from B&W Negatives by *Ernie Hearian*
For top-quality projection slides of your black-and-white photographs, try photographing the original negative directly
- 38 The Color Printer's Bible by *Bob Nadler*
First in a series: A rainbow of facts about the craft of color printing
- 60 Wall Street photographs by *Charles Gatewood*
A former messenger for a Wall Street law firm returns with a camera to record his view of New York's financial district
- 72 Carbonated Prints by *Darryl Jones*
A step-by-step guide to once-popular non-silver processes that offer dimensional-quality prints
- 82 Mimi photographs by *Dan Nelken*, text by *Mimi Nelken*
A sensitive essay on growing up handicapped
- 94 Photography's Partners by *Barrie Samuels*
It takes more than a photographer to make a good commercial photograph. We talk to some of the many people involved
- 119 Free Information Center for Photo Products
A library of useful information

Quadrolight is a registered trademark of Metz. © 1976 by Jiff-Davis Publishing Company. All rights reserved.

Copyright 1976 by
JIFF-DAVIS PUBLISHING COMPANY
ALL RIGHTS RESERVED

Beseler Color Printing Is Duck Soup...

Whether you start from negatives or slides.

RP5 Chemistry for prints from slides.

With Beseler Reversal Print Chemistry you can process beautiful color prints in minutes—with professional looking results. Use our RP5 soup at room temperature or pre-heat if you prefer for faster processing times. Either way, you'll get a magnificent quality print. Now you can enjoy the satisfaction of seeing your favorite slides turned into rich, colorful display prints—with the stamp of your own personal creativity. It couldn't be easier—or faster!

2-Step Chemistry for prints from negatives.

Beseler 2-Step Print Chemistry makes color printing from color negatives as easy as black and white. It takes just

two easy chemical steps and a brief water rinse. Since we introduced our 2-Step soup, thousands of amateurs who never made a color print before are now color printing experts. And no wonder, when you consider the crisp, beautifully color saturated results you get with a minimum of hassle or effort! Like RP5, you can use our 2-Step Chemistry at room temperature without any temperature control.

You can also develop your own Kodacolor II, Vericolor II, and similar type color negatives with our new Beseler CN2 Color Negative Developer. It's the first developer of its kind that gives you your choice of two convenient processing temperatures: 75° and 85° F. CN2 uses a three step process to give you color negatives with excellent fidelity and maximum sharpness for good enlargeability.

Why not pick up some of our "easy as duck soup" chemistry at your Beseler dealer today. Or write to us for more information.



Color by Beseler...#1 in the dark.



Beseler Photo Marketing Co., Inc., 8 Fernwood Road, Florham Park, N.J. 07932 Dept. CbB-3P

Publisher
SIDNEY HOLTZ

Editorial Director
ARTHUR GOLDSMITH

Editor
JIM HUGHES

Managing Editor
CAROL MILLER CARLISLE

Art Director
THOMAS RIDINGER

Associate Art Director
ANDREW WAHLBERG

Picture Editor
CHARLES REYNOLDS

Associate Picture Editor
MONICA R. CIPNICK

Consulting Editor
KENNETH POLI

Technical Consultant
WALLACE HANSON

Editorial Assistant
ALICE WILLIAMS

Assistant to the Publisher
AUDREY ALLEN

Sales Promotion Manager
LINDA KAUS

Advertising Manager
ANDREW E. FALCONE

Staff Vice President
and Administrative Director, Annuals
JERRY SCHNEIDER

Ziff-Davis Publishing Company
Hershel B. Sarbin, President
Furman Habb, Executive Vice President
Phillip T. Heffernan, Senior Vice President, Marketing
Edward D. Muhlfield, Senior Vice President, Sports Div.
Phillip Sine, Senior Vice President
Frank Pomerantz, Vice President, Creative Services
Arthur W. Butzow, Vice President, Production
Lawrence Sporn, Vice President, Circulation
George Morrissey, Vice President
Sydney H. Rogers, Vice President
Sidney Holtz, Vice President
Al Traina, Vice President
Philip Korsant, Vice President
Paul H. Chook, Vice President, Market Planning
Charles B. Seton, Secretary

William Ziff, Chairman
W. Bradford Briggs, Vice Chairman

35-MM PHOTOGRAPHY is published by the Ziff-Davis Publishing Company, One Park Avenue, New York, New York 10016, also publishers of Popular Photography, Photography Annual, Popular Photography's Woman, Invitation to Photography, Polaroid Land Photography, Photography Directory & Buying Guide, and Color Photography. Editorial contributions must be accompanied by return postage and will be handled with reasonable care; however, publisher assumes no responsibility for return or safety of art work, photographs, models, or manuscripts.

Ziff-Davis Publishing Company
Editorial, Circulation, and Executive Offices
One Park Avenue, New York, New York 10016
Marketing: 212 725-3777 Editorial: 212 725-7407

Midwestern Advertising Representative
Milton Gerber, The Patis Group
4761 Touhy Avenue
Lincolnwood, Illinois 60466
312 679-1100

Western Office
9025 Wilshire Boulevard, Beverly Hills, California 90211
213 273-8050, 272-1161
Western Advertising Manager,
Dan Zubernick

Material in this publication may not be reproduced in any form without permission. Requests for permission should be directed to Jerry Schneider, Rights and Permissions, Ziff-Davis Publishing Company, One Park Avenue, New York, New York 10016.

LETTERS

Raking in the gold

I want to congratulate you on publishing the unusual and very interesting article, *The Print Prospectors*, by Jacob Deschin in the *Spring 1976* issue of your 35-MM PHOTOGRAPHY magazine. At the time Deschin was conducting these interviews, I felt that he might have an unmanageable subject on his hands—but his very specific and intelligent questions kept everything to the point throughout. The whole article is a provoking and much-needed round table of discussion, ideas, and opinions. Deschin has turned in what I would consider to be a truly significant contribution in the field.

Carlton Willers, New York, N. Y.

Your piece on *The Print Prospectors* was a real delight to read and I think it's time to give Jack Deschin an award as not only one of the most literate, balanced, and intelligible journalists writing on photography—but also the most enthused! Bravo!

Weston Naef, Assistant Curator
of Prints and Photographs
Metropolitan Museum of Art, New York

Your article is fantastic! A much needed and appreciated evaluation and history.

James L. Enyeart, Director,
The University of Kansas Museum of Art
Lawrence, Kans.

Congratulations on an excellent article. It was the most in-depth report I have seen on the trend in collecting photography and its further acceptance as an art.

Samuel Wm. Sax,
Chairman of the Board and
Chief Executive Officer
Exchange National Bank of Chicago,
Chicago, Ill.

Many congratulations to Jack Deschin on *The Print Prospectors*, one of his very best articles (which is saying a great deal)! It is a brilliant piece and tells many truths badly in need of being set forth. As usual, everyone in the field is deeply indebted to him. I hope this essay will be published in book form, as it is an invaluable contribution. Dennis Longwell

has asked me to add his applause to mine.

Grace Mayer, Museum of Modern Art
New York

... the article was wonderful. Not only did I learn a great deal, but I enjoyed the learning. I congratulate you.

Anne Horton, Photography Department,
Sotheby Parke Bernet Inc., New York

In Jacob Deschin's *The Print Prospectors*, Jack's memory must be playing tricks on him. He says that Duane Michals showed at the Underground Gallery first, and that is not true. He showed for the first time anywhere at the Image Gallery in 1959. He showed the Russian pictures (along with the work of three other photographers). Duane also designed the announcement for the show. Jack may remember the picture he ran in *The New York Times*, the now famous image of the children, with one wearing glasses, a horizontal that Jack ran as a vertical, so it would "fit." Duane and I were both unhappy about it.

Just for the record, Image opened in 1959 and closed in 1961, about one or two years before Norbert Kleber opened the Underground Gallery. He called me asking if he could borrow my mailing list before he opened.

In addition to Charles Pratt and Garry Winogrand, Image had major exhibitions of photographers such as Saul Leiter, David Vestal, Enrico Natali, Sid Grossman, Naomi Savage, Charles Harbutt, and Dave Heath. Image closed with an Atget show, the Berenice Abbott prints selling for \$50 I think, and the six or eight original Atgets in the show selling for around \$100. More prints were sold in that show than all the other shows combined. They were bought by photographers.

Larry Siegel, Director, Midtown-Y Gallery
(formerly Director, Image Gallery)
New York

Regarding your publication, the last two issues have contained some of the finest articles on the art and practice of photography I have ever read.

I do have two questions, however,

relating to your *Spring*, 1976 publication. In *Being Beside, Going Beyond* you say that Karen Skelton uses Polycontrast with a No. 4 or No. 5 filter. I have never heard of a No. 5 filter and would like to know where I can obtain one. I hope this is a result of my lack of knowledge and not a misprint.

A *Mightier Mite* by Jack Manning was an excellent example on how to overcome seeming limitations of equipment. Now, is there an adapter which will let me use my Nikon wide-angles on a Leica CL, or do I have to trade in on all Canon equipment? For future reference, might I suggest an article on the use of a Minox for commercial photography or fashion illustration. (No, I'm not kidding. It would probably result in some "phantastic photography" if you had a photographer with guts enough to try it, AND an understanding client.) If you want to stay with 35-mm, write about a Tessina. I would like to see more about this fantastic little jewel, a motor drive TLR. Now if only it had interchangeable lenses!

I like what you're doing. Keep it up!
Kent Starr, Hawthorne Advertising
Fort Lauderdale, Fla.

Williams replies: *The error in Being Beside, Going Beyond was not a misprint; it was a lack of knowledge on my part. Although Karen Skelton told me in an interview that she used a No. 4 filter, when I went back over my notes I simply thought I had heard her say she used a No. 4 or No. 5 filter.*

Manning replies: *With regard to your query as to whether the Leica CL can accept Nikon wide-angle lenses, I would have to say that I think this is possible. I assume you mean Nikon single-lens reflex lenses. The procedure is as follows:*

1 You will need a Leitz bayonet-to-screw-thread adapter.

2 Next, a Canon ring that screws into the Leica thread (Canon makes one currently available for about \$12) and has a Canon F-1 type adapter on the other end.

3 This is the tough one: there is a very rare adapter ring, which enables you to put a Nikon lens on the Canon F-1 Body. This ring would fit the ring mentioned in No. 2, and would then take Nikon lenses. There are very few of these rings around.

4 Another way out, a good camera repair man could probably make this ring (in New York, try Marty Forscher of Professional Camera Repair service).

SUMMER 1976

Visionaries

I loved your article on *Equal Vision* by Suzanne O'Malley. Are there any women's groups in Los Angeles?
Hooray for women's imagery!!!
Jo Ann Bollen, Los Angeles, Calif.

Bottled up

The Bottle Brigade in the *Spring 1976* issue of 35-MM PHOTOGRAPHY has been a very enlightening article.

Thanks for the help.
Michael R. Snay, Foxboro, Mass.

Spice of life

I have recently finished reading your *Spring 1976* issue of 35-MM PHOTOGRAPHY and think it is quite different from all the other photography magazines because it specializes in 35-mm as do I. I suppose if I ever become professional I will not specialize in 35-mm but I would still read your magazine. I rave about your articles because in my opinion they cover completely what they should while many others in other magazines don't.

I have only one suggestion. It would be ideal if you could please print some more darkroom techniques and hints. If you do not you will be losing a reader.

Arthur Zeidman, Roslyn Heights, N. Y.

Cultivating Cornfield

I seldom if ever write fan letters but felt I must write and tell you that your article in the *Spring 1976* issue was worth the price of the magazine itself if there hadn't been another editorial page in it.

As a weekend pro shooting almost all available-light animal portraits and utilizing homemade reflectors such as you spoke of in conjunction with sunlight, I am much enthused and anxious to try the "one-light studio" methods you detailed so succinctly.

Jan Wayock, Pottstown, Pa.

Disneying sights

I am a collector-artist impressed by the selectively toned bike prints by Wes Disney—true, a bike fender is not the cosmos—it's just a part of it *seen*. I think they are lovely.

Paul Cava, Philadelphia, Pa.

An ode to Professor Edelson

(And an Odium to His Critics)

It may not be
That I agree
With each and every word.
But when one's credits
Exceed his debits
Attacking him is absurd!

Beseler PM2L Color Analyzer



Why It's The World's Best Selling Color Analyzer

- Direct Readout of Filtration and Exposure
- Completely Linear Instrument
- Photo Multiplier Light Detector
- Spot or Integrated Readings
- Solid State Circuitry
- Internally Stabilized
- Mirror Band Assures Accurate Readings
- Automatic White Light Protection Circuit
- All Metal Construction
- U.L. and CSA Approved
- Made in U.S.A.
- Less than \$250.00

See the Beseler PM2L at your dealer or write for free literature.

Beseler..
#1 in the dark.

Beseler Photo Marketing Co., Inc.
8 Fernwood Road—Dept. PM2L/3P
Florham Park, N.J. 07932

WHAT IS VISUAL LITERACY?

To better understand this much-abused term, turn on your television . . . and listen.

By RALPH HATTERSLEY

Modern American TV watchers constantly submit themselves to the effects of an audio-visual language controlled by people whose very survival depends on their being understood and favorably responded to.

In recent years, the term "visual literacy" has grown to considerable importance. We hear it on all sides, mainly among educators, who say that since this is a visual age, all citizens should become visually literate. This sounds very reasonable, of course, but what does it mean? Those who use the term visual literacy practically never bother to define it, and the few who try to define it seldom get very far. Thus we are left in a vacuum, told to develop something in ourselves—visual literacy—yet not told exactly what it is. As you will see in a moment, we've even got the wrong term.

Photographers are also fond of talking about visual literacy. Many assume that if a person becomes a photographer, he automatically becomes visually literate, too. Though there may be some truth in this, it still doesn't tell us anything about visual literacy per se. We still don't know exactly (or even approximately) what it is. And if we are supposed to become visual literates as a personal and cultural necessity, it is certainly something that we ought to know. One problem is that the term "visual literacy" as is doesn't fully make sense.

The term literacy is most often used to describe the ability to read the written language. If you can even read a page, you have literacy of a sort. However, if you can read a difficult page and have a substantial knowledge of the things considered worth reading, you have even more of it. Finally, if you can read the worthwhile things, judge their personal and cultural value accurately, and form valid concepts concerning the nature of the things you read, you are then literate on a rather high level. The proponents of "visual literacy"

undoubtedly mean that we should all learn to perform similar intellectual operations on the so-called visual language, or the language of pictures and other artifacts.

Since the dominant visual art and communication form is now television, this means mainly that we should understand it well—what it is, what it does, and how it does it. To take TV into account properly we will also have to expand "visual literacy" to make it read "audio-visual (and visual-verbal) literacy." For reasons that I will give in a moment, I doubt if there is such a thing as pure visual literacy, anyway. It is merely an aspect of the broader audio-visual literacy.

TV puts the problem of audio-visual literacy right in the laps of the people involved with photography, for TV *is* photography, pure and simple. There is much more to photography than TV, yet TV is an important segment of it and is the part that has the most control over the public's attention. Furthermore, it is the aspect of photography that is most actively and aggressively used as a language. When we speak of literacy, we always refer to the ability to handle language, so we can hardly ignore the medium in which the audio-visual language in all its shapes and forms is used with such powerful effect.

As you have undoubtedly surmised, I am going to dwell for a while on TV in my efforts to define audio-visual (and visual) literacy. You might wonder why I would do this in a magazine devoted to still photography, but I have several reasons: (1) developments in TV have a powerful effect on still photography, and vice versa; (2) much of what I will say about TV will also apply to still photography,





THE dx-3 HAS TWO IMPORTANT FEATURES. MORE. AND LESS.

The new Miranda dx-3 is an engineering breakthrough. Because it was designed to give *more* features and accessories, all in *less* space. Look at what the dx-3 has to offer, and you'll know why we call it the fully packed compact.



Q.I.S.* Our exclusive 4-way focusing system. Split image focusing: Vertically, Horizontally or on any linear plane. Plus a microprism finder for fast, accurate focusing. So whatever the shape of your subject or under any light condition you can easily focus without changing the orientation of your camera.



Advanced electronic circuiting system. with electromechanical shutter design for accurate exposure times. Unlike most cameras, the dx-3 is programmed for 2 second and 4 second exposures.



Miranda's no-guesswork **LED metering system.** The lighted diodes tell you if the shot is underexposed, overexposed or "OK." So your exposure is always on the button. Then the bright viewfinder tells you what speed and aperture you've chosen. And your batteries are working at full power.



The mirror box of the dx-3 is **flocked black** to eliminate light bounce. The film transport system is specially designed to keep film taut and advance smoothly. The film guides are highly polished and finely machined to eliminate scratching.



Unlike any other camera, Miranda's **self-timer** has a flashing red light that tells from across the room that it's working.



For very long exposures, just **lock** the shutter open and walk away. There's even more.

Extras like fingertip controls for easy metering. A bright, information-full viewfinder that shows you focus, shutter speed, aperture and correct meter reading at a glance.

Plus, the 50mm lens (your choice of an f1.4 or an f1.8) has a built-in lens shade — an exclusive on any SLR. And there's a full line of compact EC lenses available, from wide-angle, telephoto and zoom to macro lenses.

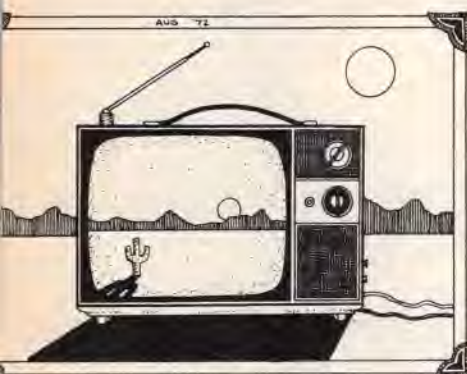
Motor drive capability? Of course. Also, there's a hot shoe for flash. That's the "more" of the new dx-3. The "less" is that it's 1/3 smaller and 1/5 lighter than most SLR's with fewer features. And it's all backed up by the famous Miranda 3 year guarantee.**

Compare. The dx-3 outweighs the others. More and less.



MIRANDA® dx-3. THE FULLY-PACKED COMPACT.

© AIC Photo, Inc., Carle Place, N.Y. 11514. In Canada: Kingsway Film Equipment, Ltd., Ontario M8Z 5G8.
**AIC Photo, Inc., fully guarantees Miranda for three (3) years from date of purchase against defects in workmanship or materials, and camera will be repaired or serviced free of charge, provided returned postpaid securely packed, plus a \$2.50 charge for mailing, handling and insurance. *Patent pending.



Sunset in the Desert, 1972

... experience with watching TV is getting thousands of people interested in still photography, and we need to know where their heads are at ...

directly or indirectly; (3) experience with watching TV is getting thousands of people interested in still photography, and we need to know where their heads are at; (4) TV is the main force welding the audio-visual language into a coherent whole; (5) it is also the main force in creating the cultural climate in which all forms of visual language, including still photography, must operate; and (6) TV and still photography are so closely related in many ways that the study of both should go on together, each one being an excellent means for learning to understand the other.

After examining TV, we will turn to still photography, mainly to see what is happening to the people whose experience with TV has encouraged them to turn to stills. If I am correct in my observations and thinking, the field of still photography is now mainly dependent on these people for its health and future growth. If not, it soon will be.

A gigantic teaching machine

Though cynics find very little good in television, I'm afraid that they just don't see what TV is actually doing. It just happens that our television industry is functioning extremely well as a gigantic teaching machine, though it is reasonable to suspect that few people in TV had this in mind for it. Circumstances and the capitalistic system forced it to develop into such a machine; and it wouldn't have worked in America if this hadn't happened.

Among other things, this famous machine is systematically and relentlessly teaching the public to respond to the visual language, which is actually a combination of words, music, and pictures, or an audio-visual language. Two main factions are involved in the incessant and extremely clever effort to evoke this response. They are (1) the advertisers who directly pay for TV (we do indirectly) and (2) the people who create the programs that entice us to watch TV. Both groups have a vested interest in using the audio-visual language with great skill and ingenuity.

The response that the advertisers want, of course, is for people to buy their products. They think that their ads must be believed in order to get this result. In other words, they must use persuasion with great skill, one way of saying they

must use the audio-visual language extremely well. I'm inclined to think that the level of belief is much, much lower than the advertisers assume and that belief has less to do with sales than they think. One reason for my view is that TV itself teaches a person to spot a lie or half lie at 100 yards.

I think that what is going on is actually a bit peculiar, that advertisers often get rewarded mainly for producing really clever ads, for using the audio-visual language at the level of poetry, which they do surprisingly often. Thus people who don't really believe the ads at all will often respond to them as a token of appreciation for not having been bored to death by audio-visual mediocrity. Whatever be the case, it should be fairly obvious that advertisers do indeed have a vested interest in clever and sophisticated use of the audio-visual language. Put simply, their survival depends on it.

The survival of the people who do the programs also depends on their excellent use of the audio-visual language. Otherwise, no one would watch their programs, and they would soon be cancelled. There are plenty of dumb programs on the air, to be sure, yet they have been well crafted to satisfy the dumb people who watch them. That is, in their own special way they use the language well and can be respected for it.

Now, the advertisers and program people must also use the visual-verbal language as a living and growing thing. They can't repeat themselves drearily but must constantly be coming up with new and refreshing concepts. And each new concept adds an extra dimension to the language. But above all, they must be understood, for their survival depends on it. This means that they must actually use their words, music, and pictures as a coherent language, one distilled directly from human experience and cleverly shaped to human desires and needs. One miss in this respect, and they're in trouble.

So modern American TV watchers constantly submit themselves to the effects of an audio-visual language controlled by people whose very survival depends on their being understood and favorably responded to. It shouldn't be surprising, then, that the language usage is usually excellent. It is a language for all people, designed very carefully to be

Sigma lenses for action. Match your competitive spirit with zoom lenses that can capture the excitement of the game. For photographs that are filled with the tension, the triumph and the fun of sporting events, we recommend either or both the Sigma 39-80mm f3.5 mini zoom and 80-200mm f3.5 tele zoom.

The Sigma 39-80mm mini zoom focuses to less than eleven inches without closeup accessories. It's one of the smallest zooms made—only 3¼ inches long—yet covers wide, normal and telephoto angles of view from 56° to 30°. Matching this flexibility with superb sharpness, this is one of the most useful optics you can mount on your SLR.

The Sigma 80-200mm zoom

picks up where the 39-80mm leaves off. It continues to give you fast lens speed, compact lens size—only seven inches long—and macro-close focusing to 16 inches... without tubes or accessories. These Sigma zooms let you track athletes anywhere a game takes them and still fill your SLR's frame.

All 25 Sigma lenses, from the 16mm f2.8 full frame fisheye to a choice of two 500mm mirror-telephotos are multi-coated for high contrast and flare reduction. Each wide angle, zoom, macro zoom, macro normal, macro tele and telephoto is computer designed and crafted from rare-earth optical glass.

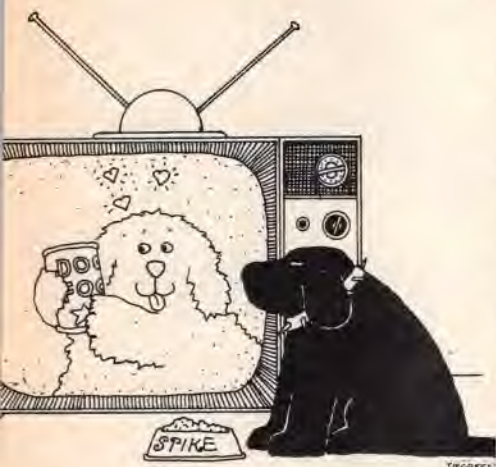
Get on the scoreboard with Sigma optics...and value. At your favorite dealer. Or write for Lit/Pak 26, Ehrenreich Photo-Optical Industries Inc., Woodbury, N.Y. 11797. In Canada: Magna Marketing Co., Ont. ☐☐☐



Sigma lenses. When the goal is excitement.



SIGMA
THE LENS MAKER



**The response
advertisers want
is for people to buy
their products ...
my view is that TV
itself teaches a
person to spot
a lie or half-lie
at 100 yards.**

understood by all, and is an accurate reflection of the overall state of development of the American culture.

Now, TV watching has been heavily criticized as an entirely passive pursuit, but this just isn't true. While people watch and listen they also think and put things together, which are hardly passive activities. In my opinion a large percentage of the viewing public has intuited rather well how the whole audio-visual language works and in this sense has become audio-visually literate to a considerable degree. And many thousands have gone all the way by bringing their intuitive understandings into the full light of consciousness. As you see, the gigantic teaching machine really works.

I believe that the people on the verge of full awareness account for the otherwise inexplicable surge of interest in still photography. Having submitted themselves for years to a visual-verbal language as receivers of communication, they now intuit how it works and see that they themselves can learn to use it in full awareness by turning to still photography. That is, they can use still photography as a tool for becoming fully aware of their intuitions concerning the nature of the new language, then use the language to express themselves as initiators of communication, not merely receivers of it. In this way, they can reach a high level of audio-visual literacy.

Nearly everything a symbol

On TV, nearly everything is consciously and deliberately used as a symbol, including gestures, words, music, sets, lighting, camera angles, props, type-cast actors, etc. This is mainly because TV time is so very costly that all the advertisers and program people feel that they must get all the communication mileage possible out of every single element that can be bent to the purpose of audio-visual communication. Furthermore, people now demand this communication density as the price of giving their attention to their TV sets. They want their stories and programs action filled, loaded with meaning, and packed in tight. In effect, even time itself is greatly compressed.

The heaviest symbolic density is in the ads, of course, for they have but a few seconds to make their pitch and leave an impression on the viewer. And the

symbols have to be used with maximum power in order to overcome the viewer's disinterest in the products advertised and his resistance to buying them.

A part of making symbols work at their best is to make very sure that the viewer understands the meaning of every one, at least on the intuitive level, often preferably on that level. Otherwise, he would not understand and respond in the desired way. Thus advertisers and program people have a vested interest in making sure the viewer is encouraged to react in a predictable way to audio-visual symbol manipulation. He must intuit that nearly everything on TV is a symbol and give it the meaning it is supposed to have in a given context.

The meaning of the symbols used (nearly everything you see or hear on TV) is distilled from the American culture as a whole, because only in this way could the advertisers and program creators be sure of being understood. The fact that the symbols are thus derived helps make the growth of the audio-visual language a healthy one, for the public itself is the final arbiter of what things are supposed to mean, which is a good thing. To reach the public, the TV people have been forced to speak to it in its own language, they themselves merely giving form to the common language. Though it is true that certain linguistic inventions originate on TV itself, they are relatively few and far between. The fact is that the language of TV is a vast collection of language inventions, many of them going back hundreds of years, and very few of them really new.

I think that the majority of people are at least vaguely aware that most things on TV are used as symbols and that they are affected by their meanings. To this degree, they should be called audio-visual literates. However, there are some who are considerably more literate, because when they wish, they can identify each symbol when it appears and tell rather precisely from its context what meaning they are supposed to draw from it, how they are supposed to react to it, and how it fits in with the other symbols with which it appears.

I believe that the latter group largely accounts for the boom in still photography. From what they have already figured out from watching TV, they are well prepared to use still

What makes Fujica SLRs so special?

'World firsts' in the Fujica line of distinguished cameras.

All Fujica cameras have a special advantage. They have behind them all the resources of Japan's largest manufacturer of photographic products, Fuji. That's why Fujicas benefit from a number of world firsts that have been hailed by experts and amateurs alike.

One world first is silicon light receptors that are far more sensitive and with a swifter response than ordinary CdS cells. All cameras on this page offer this important feature. And all reflect Fuji's basic commitment to exceptional precision, lightness and unusually compact size. It's also nice to know that whatever Fujica you select, you can use the complete line of Electron Beam Coated Fujinon interchangeable lenses.

The ST601 is the easiest-to-own

Fujica of them all. It is perfect for those who are ready for real photography. Easy, 3-way focusing: split-image, microprism, and ground glass.

The ST701 has refinements of its own, including, for example, an unusually bright full-information viewfinder with 3-way focusing. Shutter speeds to 1/1000th.

The ST801 has another Fuji world first: rapidly responding, very accurate LED exposure indication. Replacing the mechanical needle, LED indication is more precise, more rugged, and can be seen even in dim light. Shutter speeds to 1/2000th.

The top-of-the-line ST901 is the world's only fully automatic camera with LED digital readout. You can actually

read the shutter speeds in glowing digits in the viewfinder. You select the aperture, and electronics automatically set the correct shutter speed. You probably already know that leading camera magazines have praised the ST901 as representing the future trend in camera development.

Fujica SLR cameras by Fuji: very special indeed.

FUJI FILM

FUJI PHOTO FILM CO., LTD.

Tokyo, Japan

FUJI PHOTO FILM U.S.A., INC.

350 Fifth Avenue, New York, N.Y. 10001



FUJICA ST 601/701/801/901



photography as a means of self-expression. Furthermore, they can use their experience in still photography as a means for learning even more from TV with respect to how the visual-verbal language works. And as they do this, they will continually raise the level of their audio-visual literacy.

The bag of tricks

Most of the people connected with the audio-visual side of TV have little communication tricks that they use. This includes playwrights, music composers, directors, cameramen, lighting technicians, set designers, actors and actresses, sound technicians, makeup men, announcers, and so on.

Now, each trick influences what is communicated in a given audio-visual context, because this is mainly what it is for. Lighting men communicate with lighting tricks, cameramen with camera tricks, actors with voice, face, and body tricks, etc. The person who pulls all the tricks together into a coherent whole is the director, who is supposed to know exactly how all of them work.

Many programs are mainly compilations of these audio-visual tricks and little else, but this doesn't necessarily mean that they are bad. Indeed, a part of being a good director is to use the familiar tricks well, for they are an important tool for communicating clearly in the audio-visual language. Through long usage, they have come to have a great many meanings to which people can and do respond. Even so, they are tricks, though we might also call them stylistic devices or audio-visual mannerisms. Because they develop out of certain people's ways of looking at things, we might even call them ways of seeing. However, they are often spoken of as just tricks or gimmicks.

Added up, there are a lot of these audio-visual tricks, at least several hundred basic ones. Now, I would guess that a rather large percentage of the TV audience is intuitively aware of nearly all of them to the degree that they would be consciously aware of deviations from them or ineptitude in their usage. Frankly, this would indicate a fairly high level of visual-verbal literacy, mainly developed, I remind you, from watching TV. A much smaller group is *consciously* aware of nearly all the tricks (and sometimes unduly irritated by the fact that they *are* tricks) and at the same

time quite aware of how they help shape the meaning of the material on the TV screen. The latter group exhibits a much higher level of audio-visual literacy.

Again, I think that members of the more literate group are turning to still photography—for self-expression, to make sure they understand the tricks (and thus the audio-visual language) as well as they think they do, and to develop personal ways of seeing that will lead them to develop tricks on their own and thus contribute to the language.

The main point I wish to make in this section is that the tricks are an important part of the audio-visual language and that audio-visual literacy must in part be measured on a person's ability to identify and understand them.

The importance of bad TV

Despite appearances, this article is not intended as blanket praise of television. Like most people, I could write a very long list of things I find wrong with it. On the other hand, it is doing certain things impeccably well—for example, teaching people the ins and outs of the audio-visual language. Granted that there is little altruism involved here, but it's happening nonetheless as a by-product of the economic need of advertisers and program people to be thoroughly understood. As a measure of TV's teaching efficiency, you might just ask yourself how long it has been since you saw an ad or program that you didn't understand.

Now, it happens that there are a lot of very badly done ads and programs on television, but I don't get as upset about them as some people do. Indeed, I welcome them, albeit with a pain in my gut. The thing is that in terms of our education in the workings of the audio-visual language, we are fortunate to have a substantial amount of bad TV, because poor use of the audio-visual language makes its mechanics stand out clearly where everyone can see them. We can see all the tricks limping along and falling on their faces and with relatively little ingenuity figure out their natures and decide how they are actually supposed to work. This might not be possible if all ads and programs were good, for then the tricks might be used subtly enough to be beyond easy recognition as audio-visual linguistic

The heaviest symbolic density is in the ads, of course, for they have but a few seconds to make their pitch, and leave an impression on the viewer.





Ricoh Singlex.
If you're breaking into 35mm and you want a break.

A lot of camera for not much money.

You get an accurate behind-the-lens meter; a match-needle, so you're always in control of your own photographic destiny.

Because the camera accepts standard screw-in lenses, you have literally hundreds to choose from, including the superb Rikenon system: everything from fisheye to monster telephoto.

You get shutter speeds to a thousandth, so you can stop the fastest action, a self-timer, and a dozen little touches that make the difference between a great piece of equipment that doesn't cost much, and a camera that just doesn't cost much.

And it's all yours for around two hundred dollars.

Which means, if you're looking for value, you can now stop looking.



Ricoh Auto TLS EE. If you want a fully automatic SLR for the price of most semi-automatics.

This is all the 35mm SLR you ever hoped for, at a better price than you ever imagined.

The metering system works like your eye works: instantly, automatically, accurately, without a thought from you (unless you want to override). You set the shutter speed to suit the action, concentrate on composition and the camera does the rest. It's the automatic system that works the way most pros work, because it makes the best photographs. (Especially in fast-action situations.)

You can choose automatic EE lenses from our Rikenon system, ultra-wide to ultra-long, and tailor your camera to your kind of photography. Or pick from the practically endless list of screw-mount lenses the Auto TLS EE accepts: they won't be automatic, but they'll be better than they are on any ordinary camera.

You get a professional satin-black finish, hot shoe, shutter speeds to a thousandth. And more.

Imagine. No more matching needles, no more over- or under-exposed pictures — and no big price.

Ricoh vs. Ricoh.



devices.

Not to recognize them wouldn't be good, because public literacy demands that people understand the mechanics of the languages they respond to. Lacking this audio-visual literacy, they could become passive slaves of the TV industry, being led around by their noses by a language they respond to but don't in the least understand as a language. Inadvertently, the industry provides the solution to this problem by offering numerous badly done ads and programs.

I repeat: these inferior ads and programs function extremely well, because all the audio-visual linguistic devices, or tricks, are used so awkwardly that they attract people's attention to themselves and lead them to see what they would accomplish if used properly. After experiencing these linguistic devices embodied in trash, people become so accustomed to them that they can recognize them when they are subtly used in good TV, and are thus carried beyond the point of being passive victims of a language they respond to but don't in the least understand as language.

It is often said that we learn best from mistakes. Well, the manifold mistakes of the TV industry have become an important part of what makes the gigantic teaching machine work in improving public audio-visual literacy. The industry's mistakes and stupidities serve as first-class primers for the public, and there is absolutely nothing the industry can do about it, even if it wants to. There is just not enough money and talent to get rid of this very educational garbage.

Reality and fiction

Certainly, a part of visual-verbal literacy is to be able to differentiate between reality and fiction in what one sees in TV, film, and still pictures. One of the best ways of spotting something that is all or part fiction is to detect one of the tricks that have just been discussed. You then know that you are not confronting unmanipulated reality but an editorialized (and at least partly fictional) version of it. Since most adults seem to spot readily these editorializing tricks, they are seldom taken in by fiction dressed up to pass as reality.

However, there are many people in TV who specialize in making fiction pass for

reality, and some are clever enough to invent new tricks that the average viewer might not recognize as tricks. Looking at such material and seeing no evidence of tricks, he will be inclined to believe what he sees, for visual reality can be defined as that which embodies no detectable tricks. On the other hand, people of the highest audio-visual literacy will either spot new tricks as soon as they come along or will look until they find them.

The image quality question

In referring to visual literacy, it is customary to maintain that one requirement for it is an acute awareness of image quality and of the range of quality possibilities in pictures. I will go along with this, but only up to a point. The thing is that in our most important visual medium, television, we have hardly any real image quality at all, yet we manage to get along very well without it. Specifically, TV functions with quite a restricted tonal range, from dark gray to light gray. It must do entirely without a good black, a tone considered of most importance in film and still photography. Broken into fairly obvious lines, the image isn't especially sharp. And there is a constant battle with electronic image distortions.

The important thing, however, is that TV works very well despite these image degradations (so-called by photographers). That is, the audio-visual language works well despite them. This suggests that when we set out to measure a person's visual-verbal literacy, we should be a little leery of gauging it in terms of his ability to make quality discriminations in the way that still photographers commonly do. Perhaps this so-called quality isn't as important as some people think. If not, how could TV work very well with so little of it?

However, the people who are led by their TV experience into still photography have very little difficulty in picking up the traditional quality standards. This suggests that TV has taught them quite a bit about image quality, even though it has relatively little of it itself. Perhaps TV viewers develop a yearning for the quality dimensions that are missing. For example, every viewer has seen filmed or videotaped TV programs in which important segments had a lot of black in them and been

Most of the people connected with the audio-visual side of TV have little communication tricks that they use ... Lighting men communicate with lighting tricks, cameramen with camera tricks ...



The Kodak gallery.



Combine the right imagination and skills with one or more of the many types of Kodak film, and the results can be as varied as Americana. Four examples:

1. "Long Forgotten," by Gene Allebach of Tiffin, Ohio. Outdoor scene shot on Kodak Ektachrome-X film and projected on a rear screen. Window frame and projected image shot on Kodak high speed Ektachrome film. 2. "The White Church," by Everett S. Wilson of Meriden, Conn. Final slide a result of using Kodak Ektachrome film, Kodalith ortho film, type 3, and opaquing. 3. "Going Visiting," by Frank Horton of Hickory, N.C. A result of an artistic viewpoint and Kodachrome 25 film. 4. "Plowing," by Gerald Dodds of State College, Pa. A mood portrayed on Kodak Ektachrome film.



Kodak film. A variety of beautiful choices.



**Everything for any
darkroom...
from print tongs
to processors.**

You know the products. They are among the most famous names in darkrooms across the country and the world. They are, quite simply, among the very best there are. Combined under the Darkroom 2001 banner to make your life a little easier. For, when you see Darkroom 2001 products, you immediately know two things:

(1) They are of the highest quality, and (2) they are carefully selected for compatibility... the ability to work perfectly with each other.



Begin your darkroom with the famed precision of a Durst enlarger... a model for any size negative and darkroom. No one has ever matched Durst for the kind of quality you can see and feel, for advanced features, for full system interchangeability. And now there's also a full line of Durst darkroom accessories, from individual funnels to complete film processing kits to advanced resin coated paper dryers! Kindermann is one of the oldest and most respected names in the field, and the full array of tanks, reels and other darkroom accessories is now under the Darkroom 2001 label. Ready to print color? You'll find an incredibly advanced professional model processor from Durst, as well as the moderately priced Agnekolor Laminar Flow processor. And sophisticated electronic analyzers and timers with our own EPOI label. And anything in the darkroom world that hasn't already been mentioned is waiting for you in handy Photo 2001 blister packs! Look for the Darkroom 2001 label... you'll find it all over your dealer's darkroom department!

The Apartment Darkroom

Color and black-and-white printing and processing for the apartment dweller... or anyone who's cramped for space. In fact, this suggested combination of Darkroom 2001 products is so capable that you'll find it desirable even if you have loads of room. The enlarger is the Durst M301, which packs dozens of advanced features into a compact frame. Disassembles in minutes for storage, too. The M301 handles 35mm and all smaller sizes, accepts the CLS-35 dichroic color head. For film processing choose one of the gleaming Kindermann tanks, with stainless steel reel and loader. Focus the neg or chrome on a Darkroom 2001 Easel with the handy Focus Finder, and analyze with the new EPOI MM-7 Color Analyzer. Or for b&w, use the brand new Analite II darkroom exposure meter. Trim the paper with the new Durst 8x10 Paper Trimmer in the foreground, illuminated by a handy Kindermann safelight. Time the exposure with electronic accuracy with the EPOI Printrol, and then process. There are trays, etc. for b&w, or the superb Agnekolor Laminar Flow unit for color. Finally, dry any resin coated paper in the new Durst FRC 200 Dryer. It's a lot of darkroom in a little space!



**DARK
ROOM
2001**

Spotlight on...

Spectacular new EPOI MM-7 Color Analyzer Precise color printing control at moderate cost

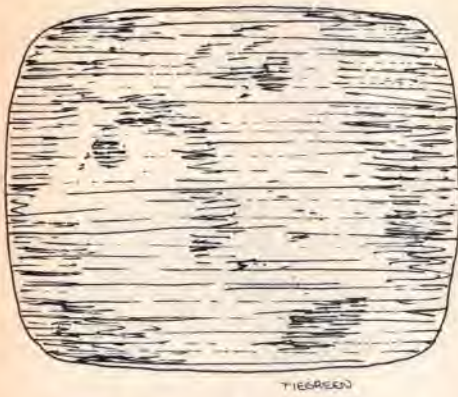


New, unbeatably accurate, incredibly talented, yet it's the most modestly priced analyzer with the accuracy and sensitivity of a photomultiplier probe! And this new EPOI MM-7 Analyzer features an exclusive new *Colortrol* electronic f-stop—available, until now, only on \$700-\$800 models! For all that, it's wonderfully easy to use—as simple as a hand held light meter!

The *Colortrol* varies the sensitivity of the color section, so that: (1) You can always use the lens' optimum aperture, (2) you can analyze thin and dense negatives without changing color balance settings, and (3) you can compensate if you run out of filtration in one color! It's unique, it's a tremendous aid to faster, simpler, better prints.

Just switch on the unit—it warms up instantly—place the probe anywhere in the projected image on the easel, take your readings with the regular and/or pinpoint aperture. The big, linear, illuminated meter scale reads out in precise seconds of exposure time and density units of filtration. Uniquely easy to read, and everything is directly, clearly proportional. Controls are big, easy to see and use, human engineering is tops. Built-in voltage regulation assures repeatable results, it all adds up to a professional quality analyzer at an unusually moderate price... ask your dealer. Or write for details. Ehrenreich Photo-Optical Industries, Inc. Woodbury, N.Y. 11797. ☐☐☐

VISUAL LITERACY?



In referring to visual literacy it is customary to maintain that one requirement for it is an acute awareness of image quality and of the range of quality possibilities in pictures.

unable even to make out what was going on. This could promote a taste for wanting to know what good blacks can do in images. At any rate, the TV experience seems to prepare people to be accepting of the standards of quality traditional in photography, and that may be at least a partial measure of their visual literacy.

The gray-tonal-range image

There is a valid kind of image quality that seems to have come directly into still photography from TV without being essentially changed. I refer to the kind of print that uses TV's restricted tonal range, from dark gray to light gray. Quite a few people are making this kind of print, even after they have learned to use the full tonal range of photographic papers. They seem to use it mostly for emotionally heavy, even morbid, pictures, though it is possible to use the same tonal range to make very lyrical prints.

Now, morbid gray range prints are an abomination to most traditional photographers, who see them as merely ugly and nothing more. They see the makers of such prints as outright visual illiterates and lousy photographers, but they are wrong in this. The gray tonal range print is a legitimate form of photographic expression carried over from TV, and we can expect to see many such carryovers in the future. When they have been incorporated into the language of TV, accidentally or on purpose, they will be legitimate forms of expression for those who use them—not measures of their insensitivity and audio-visual illiteracy.

What I'm getting at here is that television is now far and away the most important visual language form and that visual literacy must be measured in TV's terms, not in terms of lesser forms such as still photography. Anything that is an everyday part of TV is necessarily an integral part of the visual-verbal language, and so it is with the gray tonal range print. The fact that this limited tonal range is a technical shortcoming of TV doesn't lessen its importance in a language mainly being developed and taught by the TV industry. The fact that it has moved over into still photography and made itself at home there shouldn't upset us, because that is merely the way language works.

The other arts

There was a time when visual literacy depended on understanding what was going on in painting, sculpture, architecture, and the minor visual arts, for they were the primary source for our knowledge of visual language and for concepts concerning how man could sensibly think about the visual world. This is no longer true, for all the arts, major and minor, have been incorporated into television, which is to say photography. Nowadays, artists in nearly every medium work for TV, either directly or indirectly.

We've reached the point where a necessary part of visual literacy is no longer a profound understanding of what the other arts are up to, though it certainly doesn't hurt to know. The important thing is to understand what they contribute to the new audio-visual language, the language of TV. The contribution of the various arts is very great, make no mistake of that, but each contribution is subordinate to the whole. The literate person therefore is one who understands what each art offers in context.

For example, in a TV drama we witness the work of a director, actors, cameramen, lighting technicians, makeup men, set designers, music composers, furniture designers, sound technicians, special effects people, and so on, possibly even painters and sculptors. Today, the visually and verbally literate person is the one who consciously understands how the work of all these people meshes together into a coherent whole, which means that he also has to have a good general idea of what each one does individually.

Though television is merely a form of photography, it wouldn't do for photographers to overinflate their own importance in the totality of TV as a language. Essentially, photography merely happens to be the medium that can incorporate all other media to a greater or lesser degree. Furthermore, there are people in many mediums who understand just as well as any photographer how this incorporation should be brought about—actors and directors, for example.

Though audio-visual literacy means understanding how the various arts mesh together in TV, this doesn't mean that it is restricted to just a few people. To think so would be to underestimate

the power of the TV industry as a teaching machine. Now, I would say that the increase in public literacy in this sense in the last 10 years has been very dramatic. We've even reached the point where many of the top shows should rightfully be classed as genuine art. Only the general literacy of the public has made it possible for such shows to be presented and accepted.

It is true that we don't see the works of Moliere, Shakespeare, and Racine, but they are hardly the correct gauges for measuring literacy in our times. The proper gauges are intelligent and well-crafted programs that speak cogently to modern man about himself. Such programs we are seeing now in ever greater abundance. There is also plenty of garbage, to be sure, but there are always plenty of people who need it. In a thousand years, they will still be needing it.

Electronic garbage

Earlier, I discussed how one of TV's shortcomings, its short tonal range, had become embodied in the audio-visual language and has even spread over into still photography. Well, the limited tonal range is just the beginning of TV's technical shortcomings. I'm thinking now of all the electronic garbage one has to put up with if his set is less than perfect and sometimes even if it is in excellent shape.

Now, a lot of people have gotten accustomed to the garbage to the degree where they hardly notice it; for them it has become a living part of the language of TV. From their acceptance we can expect further erosions of the traditional quality standards established by photographers. If a lot of people have learned to get along without these standards, how can they be expected to pay them much attention?

Another thought: one of the main sources for creative techniques in photography has always been from image defects of one kind or another: grain, fog, reticulation, solarization. The idea was to find a new defect, then explore its creative potentials. It seems likely that this will also be done with the myriad electronic defects we encounter on TV.

Like things that were formerly seen as defects in cinema and still photography but then brought into the fold, electronic garbage will probably become an

accepted art of the audio-visual language. If so, it will certainly affect the quality standards of all of photography. I think I have seen considerable evidence of this in the young people I have taught.

In terms of visual-verbal literacy, I'm inclined to think that a literate would seriously consider the things I've just said as future possibilities, though this doesn't mean he would necessarily welcome them. Like Topsy, a language just grows, and what it turns into doesn't always please everyone. Electronic garbage is without doubt a merely peripheral part of the audio-visual language; who can say that it won't eventually move toward the center?

Truth and untruth

I think that an important part of any kind of literacy whatever is to differentiate rather well between truth and untruth and to discriminate all the shades in between. Now, TV is to a large degree a salesman's medium, and salesmen are traditionally very subtle liars. It's not so much that they always lie outright as that they cleverly shade the truth and leave out parts of it that might inhibit sales. I think that most people tumble to TV flim-flam at a fairly early age and begin to develop a healthy skepticism. Though they may buy the products advertised, it isn't necessarily because they believe the sales pitches.

Earlier, I said that people have learned to differentiate fiction from fact by learning to detect all the audio-visual tricks, or symbolic devices, used by directors, cameramen, actors, set designers, musicians, etc. Seeing such a trick, they are led to think that the truth is being tampered with somehow, though not necessarily so. Since the truth, whatever it is, is often well disguised, the reasonable response to a TV sales pitch is a wait-and-see attitude, an open-minded skepticism.

Now, such a skepticism is certainly a part of literacy, both visual and verbal, and I think it is being promoted inadvertently on a massive scale by the television industry. It is certainly not what the industry wants, but a natural development in people who are constantly being subjected to clever sales pitches. Moreover, these pitches, which often make extremely clever use of the audio-visual language, teach people rather precisely how the language of the sales pitch works, so

continued on page 116



The thing that stands out in my mind is how little people seem to care about what color they get on their sets.

CLOSET Darkrooms

By LESTER LEFKOWITZ

Ghosts, illicit lovers, dirty underwear, deflated tennis balls, and an old ironing board from pre-wash-n-wear days are items found in your everyday, garden variety closet. Throw them all out! Knock down a partition; attack the sagging shelves with a crowbar; rip out the tie rack, shoe tree, carpet sweeper hook, and wall safe. Spackle and paint; install plumbing, electrical outlets, shelving, and safelight sockets. Build a fibreglassed sink, enlarger counter, and shelving stack. Add a plethora of photographic paraphernalia and, voilà, you've got yourself a first-class darkroom. It's *the* solution for the bride's parents who have found no good use for the closet recently abandoned by Sweet Young Thing who left the nest for Dashing Dan. "We haven't lost a daughter, we've gained a darkroom."

Many a serviceable darkroom has been set up in a kitchen, bathroom, or basement; but since the first is also needed for paying bills, the second for washing the dog, and the third for rainy day roller skating, they are temporary by design and therefore often lack the amenities (and capabilities) of a permanent, or mostly permanent, installation.

In many ways a closet is *the* ideal darkroom space: no new walls need be constructed; simple weatherstripping makes it light tight; when not in use, equipment is secure behind its door; and when in use, you are secure, and unreachable, in your amberly lighted hideaway.

Herewith are two examples—one in the city, one in the suburbs—to illustrate what can be done. Both photographers are serious practitioners who needed efficient, functional, no-compromise darkrooms that would permit quick start-up and comfortable work space. (Drudgery and suffering does not *always* make a better artist.) And both were willing to spend a few hundred dollars for construction materials.

For cliff dwellers

In Patt's pre-war, New York City apartment, her bedroom had two side-by-side closets separated by a 45-year-old, built-like-a-brick-outhouse wall. (We assumed that in those days men's and women's clothing were strictly forbidden to cohabit.) And having a bathroom next to the closets (convenient for those eight-hour printing sessions, but more important for all its accessible plumbing under the sink) made for a very workable situation.

The day after she moved in, we attacked, with sledge hammers, the wall dividing the two closets, after first checking for hidden pipes and electrical cables. (It's at times like those that one loses admiration for the old craftsman's make-it-last-forever ethic.) The noise and the dust created a mild sensation in the building (it was Sunday), and the 600 pounds of rubble in empty supermarket cartons lining the hallway gave the superintendent severe apoplexy on Monday



Patt's closets *before* . . .



Author and Patt *during* . . .



After : a complete super darkroom!

35-MM PHOTOGRAPHY



Top and bottom of Patt's sink base were built separately, then moved into the darkroom. Assembled, base would not have fit through closet door.



Connection of sink base to its legs was made with $\frac{3}{16}$ -inch bolts and $\frac{7}{16}$ -inch and $\frac{3}{4}$ -inch washers in pairs on both sides to distribute the pressure.



Bathroom sink has to be removed to get at pipes that would feed darkroom sink. If you do-it-yourself, be prepared to wash your face in the kitchen for a few days.



Large blow-ups are easily made using drop top of enlarger table, particularly helpful if you're not too tall. The side leaf is shown in partially raised position. Flo-Temp that adjusts water temperature is shown attached to spigot; hose below it goes to a tray siphon for washing prints. When you buy your faucet for the sink, specify a garden-hose thread for the spigot end.



It's all there in this very wide-angle shot; lots of storage and counter space—compact and efficient.

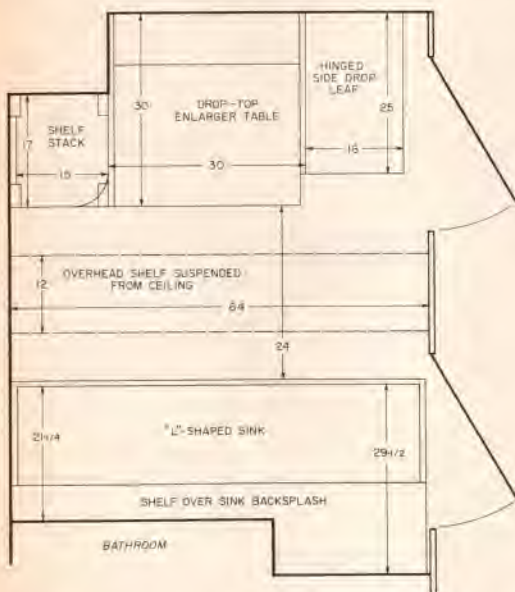
morning. Patt's lease contains the provision that the wall be replaced when she leaves. Or else!

Some spackle here and there, plywood panels over the two gaps where the dividing wall used to meet the side walls, and fresh paint on walls, ceiling and floor made a beautiful, clean 5x7-foot space. The walls were painted in a good grade of washable off-white, though yellow, beige, or pink is also okay. (Do not use colors in the blue or green family since the orange safelights will make the walls appear unnecessarily dark.) Patt's floor is concrete, so after patching the canyon left by the removed wall with patching mortar (Sears Latex Concrete Patching Kit is easy to use), we applied a coat of sealer and two top coats of bright red "porch and floor enamel."

The 35 square feet salvaged from the two closets is about the minimum space for a non-claustrophobic, conventional darkroom with a full sink for three 11x14 trays plus one 14x17x6-inch holding-wash tray (a set-up strongly recommended when doing more than a few 8x10s), a 4x5 enlarger, and room to turn around. But it's not the Astrodome, and very careful planning followed by well-thought-out design was required to obtain maximum utilization of space. As you can see from the floor plan, the strange ins and outs of the walls led to an "L"-shaped sink, which worked out rather well since there was now extra room to put a large, deep tray with a Kodak Tray Siphon hung on it to serve as a holding bath for prints coming out of the fixer. (Patt uses conventional, not resin-coated paper. At the end of a printing session she treats all photographs in a washing aid such as Hypo Clearing Agent, Perma Wash, or Hustler Hypo Remover, and then washes them in a shallow tray with a tray siphon to provide frequent water changes.)

The basin part of Patt's sink was constructed from $\frac{3}{4}$ -inch particle board assembled with screws and waterproof glue. (Particle board is considerably cheaper than plywood, takes paint better, and holds screws tighter, but it sags if not well supported; $\frac{3}{4}$ -inch particle board was used for all construction except for framing members and the removable enlarger cabinet top, which had no center support and was therefore

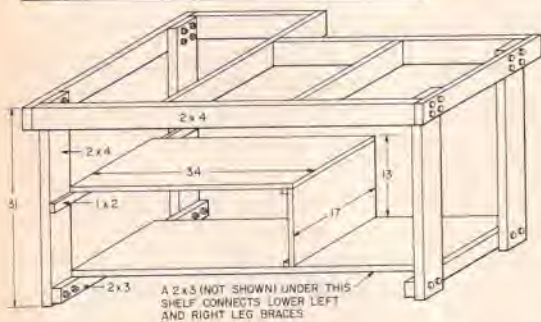
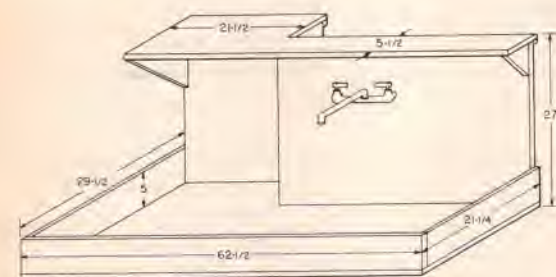
CLOSET Darkrooms



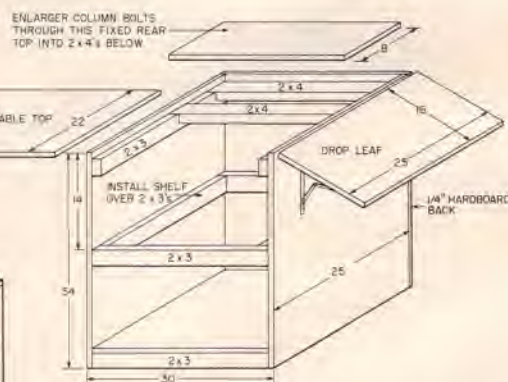
Floor plan of Patt's darkroom shows 35 square feet salvaged from two side-by-side closets in a way that makes use of every square inch of space. Hinged drop leaf on side of enlarger table can be lowered to permit easy entrance and exit.

made from $\frac{3}{4}$ -inch plywood.) The sink was coated inside with three coats of hand lay-up polyester laminating resin, a layer of $\frac{7}{8}$ -ounce woven fiberglass cloth, and a top glaze coat of epoxy resin. Fiberglass is great, it's tough, and as waterproof as a submarine. But it's a bear to apply: it's sticky, it stinks to Uncle Lewy, and you've got to work quickly or the applicator-brush will become a permanent part of the sink. "How to Fiberglass a Sink" could be a whole article in itself, so instead I will advise getting a book from your library and/or bending your fiberglass supplier's ear off. Check in the classified telephone directory under "Plastics." (The Plastics Factory, 18 E. 12th St., New York, N.Y. 10003, run by Garry Zeller, is a great source of mail order supplies, and Garry is a friendly, knowledgeable expert. Write for their free, information-packed catalog, and for \$2 you can get their illustrated bulletin *The technique of lining photographic tanks, trays, and sinks*. They also carry *The New Glass Fiber Book* by Waring at \$3.95 and *Glass Fiber for Schools* by Tiranti, also \$3.95.)

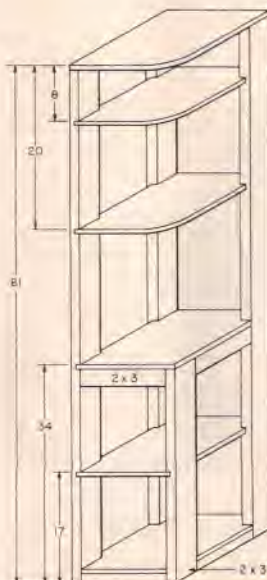
An anecdote will illustrate one pitfall of "glassing." The speed with which the resin "sets up" or hardens depends on the temperature and the humidity, and is started by mixing a catalyst with the thick resin. So Patt dutifully added so many drops of catalyst to so many ounces of resin, stirring well in a tall coffee can. After covering less than half the sink, the mixture mysteriously and rapidly got awfully thick. What became her last dip of the brush in the can just wasn't fast enough, for the whole mess solidified around the brush like an ersatz Excalibur. Many unprintable words later we figured out that the hardening reaction, which generates its own heat, proceeded too fast due to the fact that a tall, deep coffee can has insufficient surface area for heat dissipation. The second



Patt's L-shaped sink makes use of odd configuration of former closets and provides extra space for large print-washing tray. Basin was built and fiberglassed as separate unit, then attached to base support with 3-inch L brackets. (Check your door width before designing a sink.) Shelf arrangements allow ample storage of gallon bottles, and trays up to 16x20. We also chose faucet with long swing spout to facilitate washing trays.



Enlarger table has removable top that fits into lower position for big blow-ups. Spacing of 2x4s under fixed rear counter top is dependent on bolt spacing at bottom of your enlarger column.



Novel design of shelf stack provides lots of work space right next to enlarger without restricting arm movement; $\frac{3}{4}$ -inch shelves fit into grooves cut into 2x4s; extra grooves may be cut to allow for shelf height adjustment. Each shelf is 15x17 inches to conform to odd shape of room. Make your stack an appropriate size to maximize your storage.

batch was mixed in a shallow pan and Patt coated like a pro. Another tip: sand well between coats for a nice, smooth finish.

Before applying the fiberglass, we did the following: (1) rounded the top front edge of the sink for later forearm comfort when leaning over the trays; (2) drilled holes for the faucet $\frac{1}{4}$ inch oversize to allow for resin build-up; (3) attached a $\frac{3}{4} \times \frac{3}{4}$ -inch strip to the top rear edge of the backsplash; this strip later served as a shelf support; and (4) cut a hole and installed a $1\frac{1}{2}$ -inch stainless steel drain.

The sink base was made from 2x4s and 2x3s (pick out nice straight ones at the lumber yard), with the top frame and bottom frame members, respectively, glued and screwed together. The 2x4 legs, which have leveling feet (Franklin No. 6242 Adjustable Leveling Silent Glides available from your hardware dealer), are bolted to the top and bottom frame with $\frac{3}{8}$ -inch plated hex head machine screws; the bolts allow disassembly so the base can fit through the door, an important consideration. Ample storage of gallon jugs and extra trays is provided by the under-sink shelf arrangement. When 16x20 prints are made, which is quite a feature for a closet darkroom, two large trays will fit in the sink and a third 16x20 tray sits on the under-sink shelf. Another shelf 6 inches wide sits on top of the backsplash and provides a handy place for little bottles of magic chemicals, the film washer, thermometers, and a large luminous timer for film and print developing.

A coat of primer and two coats of enamel on all exposed raw wood finish and protect the sink. Wood, resin, glue, screws, and paint cost about \$75.

Moving 24 inches across the room brings us to the dry side, which consists of a 7-foot-tall stack of shelves built into the corner, an enlarger table with a drop top for making extra-large prints or doing abnormal cropping, and a fold-up leaf on the side of the table which adds an additional 3 square feet of valuable counter surface. When the leaf is up you can't leave the room, but it sure maximizes the available space. In fact, the total counter and shelf area, which includes a shelf suspended from the ceiling down the middle of the room where the old wall used to be, totals over 60 square feet; quite luxurious in a 5x7-foot room.

To make a free, uncluttered work surface, the enlarger, an Omega D2V with extra-long girder, was removed from its baseboard and bolted to the counter top's rear surface, which is braced with 2x4s for rigidity. By making one shelf in the shelf stack the same height as the enlarger cabinet, the work surface is extended farther to the left.

Notice in the photograph that the corners of the shelves closest to the enlarger have been rounded to prevent a good clunk in the head as you swoon over your pictures.

Enlarger counter, side leaf, shelf over sink, and middle shelf stack surface are all covered with plastic laminate (Formica, Micarta). If you can afford the \$1.50 per-square-foot price and have a router to trim it, it is an ideal darkroom surface, being chemical resistant, flat, smooth, hard, and easily cleaned dust free. Otherwise, use good enamel. Materials cost for the dry side was about \$110.

We lucked out with the electricity: each of the original closets had a pull-chain light over the door (you don't see that in a modern house), so it was relatively simple to tap into the line. One duplex outlet by the enlarger for its timer (a Time-O-Lite P-59), and one over the sink for its timer (a Gralab No. 300) is sufficient. For safelights, I installed two porcelain pull-chain sockets on the ceiling over the sink, one at each end, and one over the enlarger counter. Into these

sockets were screwed Kodak $5\frac{1}{2}$ -inch safelight lamps which have a standard light-bulb-type screw base. All wiring for this N.Y. City project was done using surface raceway, such as Wiremold or Walker Duct, but local codes in your area may permit (less expensive) BX or even Romex. Check first.

Plumbing is a subject that strikes fear into the hearts of grown men and women. But for Patt, a darkroom without running water was like a camera without film. So through the wall we went again, this time into the bathroom whose sink conveniently was adjacent to the new fiberglass monster. Four trips to the plumbing supply store, much under-the-breath muttering, and 12 hours later beautiful hot and cold water emerged into, and drained leakless from the waterproof (thank God) sink. If your building codes permit, install PVC (plastic) drain line; it's a snap. Plumbing supplies for this hook-up ran about \$75.

Off to the suburbs

Whether you live in the cement cliffs of the city or the sprawl of suburbia, there's never enough space for a darkroom, especially if that suburban home houses one



Roberta's closet *before* . . .



. . . and after. A dreary laundry room converted into a luxurious dream room.

CLOSET

Darkrooms

husband, three independent children, four bicycles, five pairs of skis, one goldfish, and has no basement. If mom wants a darkroom, that's fine, "but she'd better not take *my* closet." So mom uses *her* closet in the laundry room; if she's going to be a photographer, who needs all those mops and buckets, anyway?

Your standard, modern, two-sliding-door closet, in this case 21x67 inches, is not exactly ample space for a darkroom, unless you're a very small person and work exclusively with Minox negatives in contact print size. But Roberta's closet is in a laundry room that houses the usual washer and dryer, and, that blessing of all blessings, a small sink with honest to goodness running water. Permanent Press is nice, but there is still "wash" in wash-n-wear, and with three kids, daily access to the machines was a necessity. So it was decided to create a design that would use the entire room and closet for work space, and that same closet would swallow up all equipment at the end of a session to keep darkroom devices and not-good-to-drink chemicals away from 30 little fingers.

Modification of the closet was straightforward, especially without a landlord with which to contend. Both sliding doors were removed entirely (they make great desks and counters for the kids' room), and all old shelves and closet bars were pried loose. Spackle in the old nail holes, and two coats of lemon yellow semi-gloss paint completed the preliminary work.

Using 2x4s screwed and glued together for a frame, a particle board counter and bright yellow Formica for top and front, I made two counters that span the full length and width of the closet, the upper one for enlarger and work surface, the lower for storage. Both were attached with $\frac{5}{8}$ x4-inch lag screws driven right into the existing studs behind the closet walls. They are solid! An accordion-type folding door, available at home improvement centers and lumber yards for \$35 to \$140, gives complete access to the working area when open, and neatly hides the equipment when it's closed. Installation is just a matter of screwing the track, provided with the door, into the wood molding where the old double-door track used to be.

Roberta wanted a conventional shallow sink for the developing trays, yet there was no room for a permanent unit, and a sink with running water and a drain is not exactly portable. But there was already a small "wash up" sink in the room between the washer and dryer. So I designed a



To block light from the main window, a hardboard panel fits into a groove made in frame built around window.



Light-proof cover for window in door clips on with conventional storm window hooks, is secured at bottom with gate latch eye.



Entire darkroom stores inside closet. Here, dry sink is being rolled out. Note how it is also used to hold trays, siphon, etc.



If you are a good parallel car parker, you'll find it equally easy to maneuver the sink out of the closet.

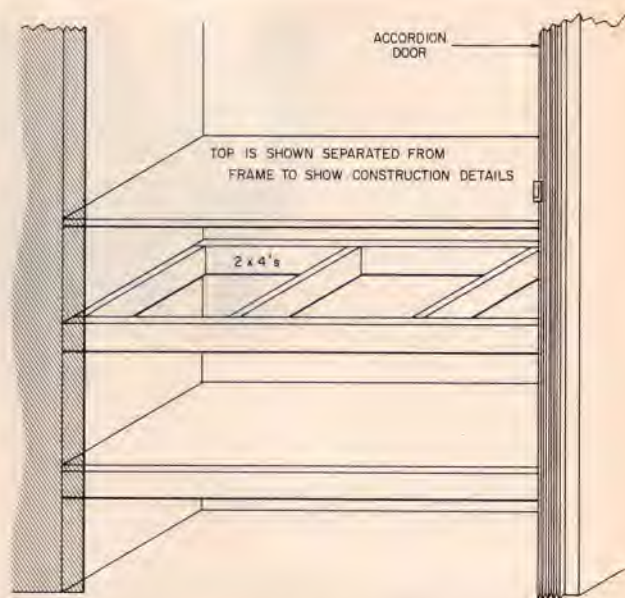
collapsible dry sink. It's 21x68x5 inches inside, and its $\frac{3}{4}$ -inch plywood core is covered outside and in with plastic laminate; all joints were sealed with General Electric clear Silicone Seal to make it waterproof. The left end sits on top of the washing machine, the right end has a hinged plywood leg panel that folds under the sink as shown in the photographs. Small plastic swivel casters attached to the outside of the folding leg panel allow it to be rolled under the storage shelf in the closet as easily as pushing a little red wagon. And like the red wagon it stores everything: trays, tongs, tray siphon, thermometer, graduates, timer, and window covers (more about those in a moment).

No water is ever poured directly into the dry sink; it serves only as a convenient, easy to clean, drip and splash catching surface for the trays. Running water for print and film washing is provided by the little sink already in the room, with the print washer being a large, shallow tray and tray siphon combination sitting on top of the clothes dryer and emptying into the existing sink. For the temperature accuracy required for film developing, Roberta fills a large, deep tray with water of the desired temperature, and keeps her stainless steel tank and chemical bottles in that constant temperature bath.

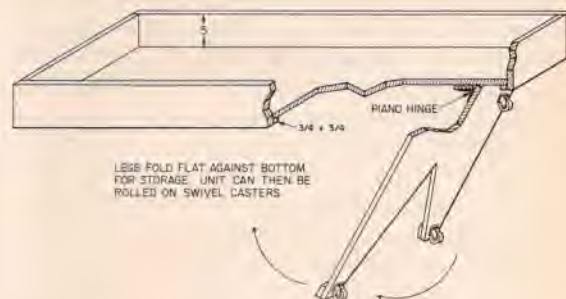
Electricity was no problem since there were numerous outlets in the room that were extended by using clip-on plugs, lamp cord, and insulated staples, all available at any hardware store. But keeping the dark from leaking out, *that* was a problem.

This little room has three doors, including one to the outside world, one to a playroom, and one to the living room. Obviously, unlike Patt, Roberta could not turn out all the lights on the other side of the doors, especially the side entrance. So that no beautiful, natural light is lost when the room is used for non-photographic activities, I designed removable $\frac{1}{4}$ -inch Masonite panels, which neatly store in the roll-away dry sink. Around the large window is a frame made from 2x3s; a groove in the frame, and the edges and window-facing side of the Masonite were painted flat black to absorb as much light as possible. A small handle was attached to one side, and Frost King No. 1400, $\frac{7}{8}$ -inch Flex-O-Mold neoprene weatherstripping stapled to the right-hand back edge of the Masonite that has no 2x3 frame to block the light. The window in the door was too tall to take a slide-in panel, so here I tacked a $\frac{3}{4}$ x $\frac{3}{4}$ -inch pine strip around the perimeter of a piece of Masonite. The inside dimensions of this pine frame just fit

continued on page 107



Wood 2x4s support counter built into former closet. Frame was glued and screwed together, then attached to studs in wall using lag bolts. Accordion door folds neatly out of way for enlarging, yet protects all equipment when folded.



Dry sink is 21x68 inches inside, which is ample space for four 11x14 trays. Material is $\frac{3}{4}$ -inch plywood (for lightness and strength). Leg panel is held open with two 6-inch gate-latch/eye-bolt sets (not shown).



When Roberta is finished for day, everything hides neatly and safely behind accordion door.

One end of dry sink sits on top of washing machine (far left). Here it is being lifted into place; it's even easier than it looks. Covers on windows are in place.

NAKED TRUTH

By ALICE WILLIAMS

"I dote on myself, there is that lot of me and all so luscious. . . ."

Walt Whitman, *Song of Myself*,
Leaves of Grass

Throughout recorded history, people haven't felt comfortable with their bodies. Adam and Eve ate the forbidden fruit and became aware that they were naked—not that they were thieves, trespassers, and dummies for letting themselves get suckered into taking the one fruit in the Garden not given to them—but that they were naked. Later the Greeks made the human body an object of art, but were marked down in history for rampant homosexuality. Poet Walt Whitman recognized the beauty of our selves—body and soul—and was ostracized for writing his celebration of it. Women who posed for nude photographs in the early days of photography (for there were few male models and few female photographers) were often prostitutes and other women with bad reputations.

Today the media tells us we have gone through a sexual revolution; they tell us that nudity is no longer verboten. Today nude models are not so easily cast into the high sinners' category. But stigma still hangs upon taking one's clothes off in public, whether for artistic or pornographic photographs, nude paintings, or in nudist camps.

Maybe it is better to put the question, "Why *not* pose without clothes?" rather than the more standard "Why pose without clothes?" Why do people feel so inhibited by what really should be simple—we were born without clothes

and nobody said, "Egads, hide the kid. He's naked." So why such a fuss now that we are grown?

Frankly, I never thought of posing nude or photographing nude while growing up as a farm kid in northwestern Ohio. At the time, I was more than a little shy and embarrassed about myself and my body, and also rather constrained by my upbringing in the Evangelical United Brethren Church, where we were exhorted not to drag on the Killer Weed (tobacco—the funny stuff was out of our league), guzzle at the moonshine or any other interesting beverage, or do any premarital or extramarital fooling around. I sometimes think the social rule-setters were also against marital fooling around. It was a very limiting existence, meant to do nothing more than prepare people for a very limited future as farmers in northwestern Ohio.

I survived through fantasy, writing, and a gift from a neighbor. My fantasies were typical young girl's fantasies—I was the madam in a brothel, only to my young girl's mind, which didn't really know anything about sex but was preoccupied with it anyway, the women paraded around naked and the men looked at them and were happy. My writing was mainly about animals. The gift from my neighbor—a box camera—provided my entry into the world of the artist where I could transform my fantasies into something concrete—what is called, although I didn't know it then, art. The nearest art museum was 60 miles away and I can remember only one art course at the school I attended—and that was

available for only one semester. As far as I can remember, I visited the museum only once. Then I was with a group of people from my junior class, and believe me that's no way to see what is in a museum. So my photographic images were pictures of siblings, our cats held up by their forepaws to have their portraits taken, the dog lying beside the broken lawn chair, and one or two lopsided pictures of Mom and Dad ready for church.

My visions of nude people stayed inside my head, coming only to mind when I lay in bed at night wondering what was happening in the bedrooms of the world.

The thought of being in a nude photograph first hit me as a college dropout in Cleveland in 1968. I went to a movie, *Joanna*, starring Genevieve Waite. Although the movie didn't impress the critics or the box office pollsters, it impressed me, especially the set designs—and especially Joanna's apartment, and the photograph she had hung above her sofa. It was a huge picture of herself sitting with just a tie around her neck; nothing else, just a tie. It was then that I decided I needed something like that in my apartment.

At the tender and extremely naive age of 20, I was just too frightened to go ahead with the idea. But the seed germinated in my mind, and every once in a while someone would throw some fertilizer on it.

Over the next eight years I became more and more involved in photography. I moved to New York and began working

35-MM PHOTOGRAPHY



Jack Bussmann, 26 and a graduate of the Rochester Institute of Technology, likes the mystery of woman. To achieve this sense of mystery, he asked model Sherri Smith, left, to hold this piece of wet chiffon against her body. He made the shot with 50-mm lens, 35-mm SLR, Tri-X developed in Microdol-X, and one studio light in front and two behind. Print was developed in D-72, a Kodak formula.

Michael Keller, 21 and a photographer who has taken two courses at SVA, used a 35-mm SLR and a 28-mm lens, Tri-X rated at 200, and a shutter speed of 1/8 second with aperture set for f/5.6 for this nude photograph taken in an attic, right. He developed the film in Kodak D-76 diluted 1:1, using slight under-development.



NAKED TRUTH

for POPULAR PHOTOGRAPHY and its SPECIAL MARKET PUBLICATIONS. Nude photographs are an everyday occurrence in New York. They cover the newsstands. They peer out from the laps of demure ladies sitting with legs crossed at the ankles on subway cars. Sin isn't in in Sin City and it's nearly impossible to be inhibited in this most mind-expanding of locales.

Living in New York exposes one to new visions. I felt that it was necessary for me to go beyond the limits I had set for myself, and one way to do so was to throw myself outside social conventions. I studied the myth of Norman Mailer, whom I greatly admire. I read about Clifford Irving. I heard of Carson McCullers. All these people had done something totally shocking and caught the public eye; at the same time they had enlarged their lives and their views of the world. Perhaps I needed to do something myself.

I loved to collect nude photographs—there is something very beautiful about the nude human body. And sometimes there is something very amusing about the way certain photographers like to show it. I wondered what it would be like to photograph and be photographed in the nude. Richard Busch, POP PHOTO'S Feature Editor, told me that he and Karen Tweedy-Holmes, one of the first in the new wave of female photographers to shoot male nudes (Imogen Cunningham had photographed her nude husband in 1917), had discussed that same subject but he had never gone on with it. It took me a few more months of the seed sprouting before I decided it was do or die.

In a way it may have been easier for me than for a man to pose nude. Traditionally, nudes have been female. *The Encyclopedia of Photography's* article on "Nude Photography" never mentions that it is possible for males to be photographed nude. Most male editors and publishers just aren't interested in the subject. According to Arthur Goldsmith, our very own editorial director and author of the recent book, *The Nude in Photography* (Ridge Press/Playboy Press, New York, 1975), there were few male nudes included because "There are not enough high-quality photographs of male nudes to choose from, although this situation is changing. Throughout most of the history of photography, the western world has been a male-oriented society,

and photography, with some notable exceptions, a male profession and hobby. Under these conditions it is not surprising that a strong element of sexual exploitation, sometimes overt and blatant, sometimes more subtle, should be reflected in nude photography, and that much of it should be done by males to titillate or satisfy male egos. . . . The 'taking' of a photograph is something of an aggressive act, and the taking of a nude woman's image by a man particularly so. Of course, she may be a willing partner in the act of 'giving' herself to the camera; it may satisfy her own exhibitionism. The transactions between a woman being photographed and a male photographing her are not always as one-sided and exploitative as some radical women's libbers would have us believe."

"My visions of nude people stayed inside my head, coming only to mind when I lay in bed at night wondering what was happening in the bedrooms of the world."—Alice Williams

Perhaps it was exhibitionism that made me want to be photographed; perhaps it was aggression that made me want to photograph. But I disagree that there are no good male nudes around—just look at the images accompanying this article. So I decided that it was necessary for good journalism to expose both sides of the story.

Originally, I meant this story to be an "I can do it, so you can do it" article. That hasn't worked as well as I would like. Instead, it is an "I can't do it very well because I'm so inhibited and here's why I am inhibited but you don't need to be too" article, with balance brought in by other, more relaxed, photographers and models.

Perhaps I am inhibited because of my upbringing. My parents don't think much of any kind of goings-on. They are traditional Protestants and not really knowledgeable on art. They don't

particularly know what I am doing or why I am doing it. I feel that I am letting my parents down by doing this, but I really have no choice. One can stay tied to one's mother's apron strings forever, living a life that has already been lived once by the parent preceding. Or one can strike out for new frontiers—do the Star Trek bit. I want to live my own life, and if that means doing things that certain people may object to but that I think will help me go to another level of thinking, then I just have to do it.

The traumas I experienced because of modeling nude were ridiculous. When I saw the photographs George Chinsee made, I became very upset because in one of the photographs my stomach was hanging out. I thought I had a nice body, but those pictures told me differently. I almost burst into tears right there.

The photographs by Karen Skelton were the easiest for me to handle. Skelton is one of the most perceptive and talented artists I know, and she knew exactly how to make a good portrait of me—for that is what the three photographs represent—me and my personality. Also, I am much more comfortable around women; I'm not afraid of violence at their hands, although it is probably just as likely to happen.

My nude female model was also easy to photograph; my main problem there was that my apartment, where we photographed, was much too small for me to do anything good. I kept stumbling over put-aside boxes, which I have never been able to put aside successfully, chairs, my feet, etc. It wasn't the greatest way to feel comfortable although my model, an old friend, was quite at ease. Because of the nature of her job, she stipulated that her identity be kept secret. Other than that I had nothing to worry about—as you can see, she has a beautiful body; she was able to do the poses I asked of her; she was totally cooperative.

For my male model I had another kind of problem. Basically I am very frightened of male aggression—or really any kind of aggression. Originally I had wanted to shoot a male friend of mine, because I knew him well and also knew that the only aggression in that relationship was going to come from me. That was something I could control. I have something I would like to say about this man. But he was camera shy—he said I would probably use the



Patricia Grantz, 25, photographed her lover, left, in an apartment on E. Fourth Street, Manhattan, because, while taking a bath with him, she noticed the beauty of the available light falling on his body from the side window. After jumping out of the tub and toweling herself dry, she picked up her 35-mm SLR. She shot with 24-mm lens and Tri-X rated at 1,600. Film was overdeveloped in Kodak HC-110.

Dianora Niccolini, who has been a medical photographer for 13 years, and attended Hunter College and the Germain School of Photography as well as the Art Students League classes, used a 35-mm SLR with a 50-mm lens to get this photograph of her sister's fiancé, below. Tri-X film rated at 1,000 in bright sunlight was exposed for 1/500 second at f/22. For this result, she first made a standard print using Neofin developer for the grain, then photographed it, developed the negative, flashing a light halfway through the development to get the Sabattier effect, then made a print. The photograph was taken in the Catskills.





Karen Skelton, 29, took these photographs of author Williams, above, in a vacant apartment.

To get the light-filled appearance, she posed the relatively calm model seated before a window and bounced one electronic flash to get more light. She exposed 2475 Recording Film normally in her 35-mm SLR with 105-mm lens, then developed it in DK-50, and printed the portraits on Kodak Polycontrast with No. 4 filter. Annette Farrow, 24, has studied with Jerry Uelsmann and the Women's Workshop. She spent five years as a darkroom technician for a small custom lab, and has shown in various exhibits. She photographed this friend, right, in available light on Plus-X with a 35-mm SLR and 50-mm lens, then toned print.



NAKED TRUTH

photographs to wreck his reputation. Besides, he seemed to be always busy. In other words, he just didn't want to.

So I looked to other men, but I just couldn't find one I really wanted to photograph. If I found a man with a good body, I couldn't stand his personality or I was afraid of him or didn't know him well enough. It got down to the finish line and I still didn't have a man to photograph. Finally I asked a female friend if her lover would pose. She asked him and he said yes. It was someone to fill the gap and maybe my friend would come through after all.

The shooting was a disaster. He started clowning around, we all started laughing, and I got totally inappropriate expressions. Apparently he conceived the shooting as my attempt to portray him. I wanted it to be him portraying what I felt. He kept smiling; I kept shooting. I wasted two rolls of film. The third roll the two of them got in on the act, and out of that came some good shots, simply because then he began to act as I wanted him to.

But after that I finally persuaded my friend to let me photograph him, and made some very good pictures. Last-minute excuses were, "Wait until I get a tan" (what difference does it make with black-and-white pictures and, besides, my conception required a somewhat delicate, frail-looking male), "I'm not very together tonight," and the usual, "I'm afraid what you'll do with the pictures" (of course I'm going to publish his full nude photograph in one of those gay magazines sold in 42nd Street shops).

I have a great many fears about the male person, about sex and about nudity. I wanted to work that out through these pictures. Perhaps I succeeded, but it will probably require a lot more work.

I still am constrained.

As a photographer, I had no trouble dealing with nude people—for the most part I didn't feel uncomfortable. But I tried to avoid looking at my first male model more than necessary because I felt my female friend, who was present, might get upset if I showed any interest.

As a model I felt more uncomfortable—especially the first time. Chinsee did his best to make me feel relaxed. Mostly I felt ridiculous—one's clothes are such a mask to hide behind. And I was cold. We shot in a studio on a cold day with little heating. Now I know

why the models in *Playboy* have erect nipples.

Other people seem to deal with the experience better, but perhaps that's because they have been doing it more. Except for one class on shooting a nude model, I had no previous experience. Karen Tweedy-Holmes began photographing nudes in college in 1964. At first she concentrated on female nudes; she was more comfortable with them. And on classical motifs—knees, elbows, breasts, form. It is amusing to see that much of the male nude work today is using that same approach, a way of doing the male nude without doing the male nude, *n'est pas*?

**"We set up the lights,
set up the background
seamless paper,
and got everything
together and
loaded up the cameras
with film. Then he said,
'O.K. I think
we're ready,' and
she just took off all her
clothes, put her hands
on her hips, and said,
'O.K. Tell me what to do.'
—Michael Keller**

Tweedy-Holmes found her form studies uninteresting, and went on to do portraits to show what people are beyond the shapes of their bodies.

In 1968, which was still long before most other female photographers were doing any nude work, Ralph Hattersley, who was then teaching at the School of Visual Arts in Manhattan, told her she should photograph male nudes. Her first session, she "assiduously looked the other way during most of the shooting" and produced little of artistic merit.

But after that she continued to do both male and female nudes and learned to look at them, with pleasure. "I like bodies. The way people look undressed is nice." Photographing people nude simplifies them, she explains, adding that nude photography isn't just for

glamor, it shows character also.

Most of the photographers I talked with preferred to photograph one sex or the other. Tweedy-Holmes didn't really have any preference, but she did notice a difference. "There's more laughter with men," she observes. Men seem to accept the resultant photographs whether or not they're beautiful while women try to be beautiful. There can be a difference between what the photographer and model expect. She photographed one friend who, unbeknownst to her, had worked out in the gym three weeks before the scheduled shooting. She thought she would be nervous because she was attracted to him; he thought the whole thing would be posed, arty. It all turned out to be very relaxed.

Her average time for photographing is two hours.

Her main advice to other photographers is to establish a nonthreatening tone. She doesn't have much trouble because she had known her models for a long time; they are old friends, no one just off the street. Being nude presents one problem in the case of male models—they occasionally have erections, which she chooses to ignore. "It's no good for portraits because the face is completely ignored," she says.

Tweedy-Holmes has evolved over the years from the more formal poses shown on the accompanying pages to semi-candid outdoors—not necessarily in nature, just outdoors on a roof. She derived her humorous approach from former teacher Ralph Hattersley, and admires Eva Rubinstein and Edward Weston. Much of her admiration goes to non-nude photographer Josef Koudelka, and much of her photography today is of animals, portraits, architecture—"nudes play a very small part in my total work," she explains.

Although photographer Annette Farrow does other subjects besides nudes, she is well represented by her male nudes. She's shot only males so far because it's been easier to get male models. While taking a class at Apeiron, she photographed one of the male staff members. He knew what to do; she found photographing him very easy. Another man she photographed had shorts on, but it didn't show in the picture. To get her subjects to loosen up, she tells them to relax and think about God. Although that might not relax many people, it does the mystical men she

The author, Alice Williams, took her first photography class while at Ohio University from Charles Scott, now picture editor for *The Chicago Tribune*. The model for shot at right calls this image, "the concentration-camp one." Both it and the male nude study were made with the same equipment and technique. Williams used two photofloods with a 500-watt bulb in each in the bathroom to the subject's left to get a sunlit effect. Other equipment was a diffusion filter, a 50-mm lens, and a 35-mm SLR. She exposed Tri-X film according to the in-camera meter reading, then developed it in D-76. Williams chose Agfa Brovira No. 6, developed in Dektol, to make more of the in-between gray tones drop out.



George Chinsee, 21, a graduate of New York's High School of Art and Design and a student at SVA, likes to combine sex and violence in his photographs. "One of my secret ambitions is to be an actress, and being a photographic model allows me to do so. This was fun, even though I don't like the bulges," says model-author Williams. Chinsee used an electronic flash, 35-mm SLR with 50-mm lens, and Tri-X rated at 200. Shutter speed was 1/60 second; lens aperture, f/11. He underdeveloped the film in Kodak D-76.

NAKED TRUTH

knows.

Her shooting of nudes "just sort of happened" about two years ago, after three years of photographing other subjects. She was shooting portraits and someone said she ought to do male nudes, that those pictures were stronger. Like Tweedy-Holmes, she had been influenced by Weston, who, like her, shot for strong shapes. Her other influence is feminist—she is very much concerned with the rights of women and wants her photography to reflect that. Farrow makes her living as a professional astrologer, and is a Gemini, the sign of the communicator.

An Aquarian, the sign of the original thinker, is Jack Bussmann. Bussmann, like his model, Sherri Smith, whose interview appears later in this piece, became involved with nude photography in college.

He says he shoots nudes out of curiosity, out of a need to release a certain amount of sexual energy through photography. "It is a seduction with a camera," he explains. That is why he isn't interested in shooting male nudes, because he is "too close to male things. I don't feel the same attraction for it." Woman is more mysterious.

He is interested in photographing woman, the form, rather than woman, the personality. Most of the photographs in his portfolio are of women without faces. Bill Brandt has influenced his photography, which he feels is more rewarding than other ways of releasing energy. Emotion in a photograph lasts longer, he says.

When he first started shooting, he got a female friend to bring him her girlfriends in exchange for her using the darkroom on Saturdays.

At first he and his models felt uncomfortable, but it was something he had to do. "I looked at other work and felt I could do better," Bussmann says. So he went about getting models, which, he admits "was a real problem." But after the initial difficulty, word got around that he was a good photographer and not a lecher, and women came to him. Some were models who needed shots for their portfolios; some just wanted to be photographed. Now he works as an assistant for photographers who do *Viva* and *Penthouse* work, and many of the models who come there need more prints for their portfolios.

While in school, he paid models \$5 an hour or gave them prints for their time.

SUMMER 1976

Now he only trades prints for time. His nude photographs are not made to sell to anyone in particular. "There's no real end result. I'm not doing it for a magazine, just doing it for my own real enjoyment, expression."

He's photographed more than 100 nudes in the six years he's been shooting them. At 26, that means he got an early start. Part of the reason he has such success with getting models is because he works in a studio. "It looks professional. It doesn't look like somebody's bedroom," he explains. People who are just starting out may appear too eager. "You have to pretend you could care less." His boss tells him

"I've posed in the nude. I feel much more comfortable being on the other side of the camera. I don't enjoy being photographed. I'm not an exhibitionist; I'm definitely a voyeur. I've found my niche in life."
—Dianora Niccolini

the actual taking of the photograph is only 10 percent of the work, the rest is getting it together, etc.

"I'm certain any beginner would get flushed," Bussmann says of the entire experience. "But if you like someone's face," he continues, "you photograph the face; if you like a body, you photograph the body; if you like an apartment, you photograph the apartment."

One problem he encounters is that it is difficult to direct models without touching them, and because they are nude he is afraid of frightening them if he touches them.

The popular image of the nude photographer is that he/she is a playboy/playgirl only looking for kicks. Nothing could be further from the truth. If a photographer took as many women or men to bed as people think, he wouldn't have the time or energy to photograph,

Bussmann says. The image of the photographer as shown in *Blow-Up* doesn't apply to him or anyone he knows. Women don't come on to him. "I wish I had (a problem with women coming on). I'd love them to chase me. Maybe I just don't give the impression that I want them to come on to me."

That thought was echoed by the other two men I interviewed for this article—George Chinsee and Michael Keller.

Chinsee says it another way. "The photographer is obligated to treat the model with a certain amount of respect. Male or female. The photographer's always screaming about rights, and I think it's important that the model have a certain amount of rights; nothing special, just human rights. Like they shouldn't be photographed in a degrading way, in any way that they probably wouldn't want themselves to be shown, because photography is a really strong tool. It can say anything you want it to say, and a certain amount of human dignity and respect should be shown on both parts. There are stories about guys who go to Central Park and shoot girls and retouch someone else's head onto it—they appear in Germany or somewhere. I'm sure you've heard the stories about photographers chasing models around studios." He says he has never had women come on to him while he was photographing them, but he would like it. With female photographers, it seems that they wouldn't like advances; with male photographers, it's the opposite. It seems to be a part of the male fantasy that women will chase them.

Chinsee is a student at the School of Visual Arts and was a bit astonished when I asked him if he would photograph me nude. "I thought it was an unusual request," he explains. "But I like to leave myself open for things like that." He didn't feel frightened; I did.

He's photographed both male and female nudes and posed himself, although no one viewing that particular picture would know it was him. The first time he shot nudes, his subjects were a male photographer who was also a friend and a female model who was also a student at SVA. "I think those were some of the best things I ever did." That work wasn't done in a studio, but he has shot nudes in a studio class at SVA and didn't like it because all the work "seemed like it turned out the same." For the nude shots of me, I insisted we

NAKED TRUTH

use a studio, simply because I felt more comfortable.

What he likes to photograph are sex and violence fantasies. "I liked what we did here," he says, although he isn't interested in acting out those fantasies except on paper.

"I have no preference as to what sex I photograph nude," he says. He photographed one man just for the muscles in his back, and another for an essay on aging. But he doesn't plan the exact poses he shoots. "Once I planned a shooting and it was terribly boring."

He doesn't feel uncomfortable with nudity. He has a certain philosophy about it. "Boys when they're growing up see other boys a lot more often than they do women, other girls. So it's really interesting that most boys like to shoot girls. They know what the male body's all about (doesn't this sound like Bussmann's theory?). My first adult exposure to nudity was at a swimming hole, skinnydipping. And there were about 30 or 40 people—different shapes, different sexes, and everyone was sort of asexual."

Keller, the other man I interviewed, has shot both male and female nudes, including his 18-year-old sister who wants to be a model. "We just decided to do nudes one day. That was the easiest thing to do, my sister. We're so close, but not that close. A lot of people walk around naked in their own house. They don't have hang-ups about seeing their sister or brother nude."

The first time Keller photographed a model nude he was more nervous. It was in an advanced black-and-white techniques class at SVA. "Ed, the instructor, said we were going to shoot a model. I thought it was just going to be a model. We were going to do some modeling and what not. We set up the lights, set up the background—seamless paper, and got everything together, and loaded up the cameras with film. Then he said, 'O.K. I think we're ready,' and she just took off all her clothes, put her hands on her hips, and said, 'O.K. Tell me what to do.' Everyone was like, 'Huh?' It's breaking the ice and it took everyone a while to get into it. No one would tell her what to do. Ten minutes after beginning, everyone was saying, 'Do this, do that, get out of my way.' Suddenly everyone didn't have enough film.

"I think the greatest fear is having a nude model and not knowing what to do.

Once you've shot the first time and broken the ice you can come up with ideas. You are expected to just take command and say, 'Do this, give me that, I want this over here, and this like this.' If you stand there with your camera around your neck and scratch your head, you can feel really uncomfortable."

His advice: "Talk to them like they have clothes on. That's very important. You've got to talk to them like there's nothing wrong, they have nothing to be ashamed of. You go about your business as a photographer. That's what you are into. If you're into looking at naked people, just getting people to pose

"The photographer is obligated to treat the model with a certain amount of respect. Male or female. The photographer's always screaming about rights, and I think it's important the model have a certain amount of rights."
—George Chinsee

naked for you, then that's another thing. But if you're a photographer, you'll just go about your business like any other photography thing that you shoot—a little kid, or a horse, or anything." Models are more able to relax if either they are professionals and do it for a living, or they are good friends and want to be photographed. "You can't photograph anyone who doesn't want to be photographed. Working together is very important." It is much harder to shoot a friend of yours whom you haven't seen in the nude than it is to photograph a professional model. "Because here you've known this person for a long time with their clothes on and now you've got to photograph them with their clothes off. Sometimes when you photograph a friend you can feel their uptightness. You may not be uptight, but you can feel that they might be. I'm a very sensitive person. I can feel

that. I'm feeling their uptightness and trying to work around that into a more comfortable atmosphere." Doing that may take time away from getting a good shot.

To get that good shot, he uses as many as seven rolls of 36 exposures per session. "It all depends on how you're shooting. A lot of time you waste film by working toward something. It's like you go from one pose to another and you shift space a little bit more and it's getting better and you've got to keep on shooting. You just can't stand there, especially when you're shooting a nude, and have nothing going on. I think the more you shoot, the more they get into it. When you're not shooting it gets stale."

He doesn't really feel inhibited about it. "You've both decided to do it but when you get down to the nitty-gritty and the clothes come off you feel just slightly inhibited in the very beginning. Not inhibited, just a little bit nervous."

Someone else who was nervous was Karen Skelton, the photographer who did my pictures. She says, "I thought that I was never particularly interested in doing nudes and when you asked me to do it I said, 'Oh, yeah, I'll do it,' and then I didn't know what to think and I had to think about what I was going to do." Because she is not interested in photographing nudes for form ("It's been done before"), she felt she needed to make a portrait. "It would have to say something about you to be interesting."

Skelton says she sensed a conflict in my personality—that although I tend to act free outwardly, I am rather inhibited. I'll drink to that. She attempted to portray this part of me in the pictures.

Besides being nervous about shooting nudes, she didn't particularly think it would be interesting. But she has changed her mind since photographing me and now has another project in mind for more female nudes. Her reservations about doing nudes ranged from fear of being exploitative to making the model feel uncomfortable. Now if the model wants to do it, it's all right with her.

It is sometimes difficult for photographers to get models, and it is especially difficult for photographers to get models willing to pose in the nude. Although there really isn't any valid reason for this hesitation, social mores cause people to refuse the experience.

Dianora Niccolini, who has

continued on page 113

35-MM PHOTOGRAPHY



One of the first of the new wave of women to photograph nude males was 33-year-old Karen Tweedy-Holmes, who studied at Columbia University, the School of Visual Arts, New York University, and the International Center of Photography from such luminaries as Ralph Hattersley, Dorothea Kehaya, Roman Vishniac, and Paul Byers. For this romantic image at left, Tweedy-Holmes used a 35-mm RFDR and 50-mm lens, Tri-X film, and two 3200 K bulbs in reflectors to light the scene. She developed the film in Rodinal. Tweedy-Holmes also used a 35-mm RFDR but with a 135-mm lens and Kodak black-and-white infrared film to make this picture of male torso, above. The body was lighted from two sides toward the front with 3200 K bulbs and reflectors.

B&W Slides from Negatives

By ERNIE HEARION

To most photographers, the only thing more important than making a photograph is showing it. If you're anything like me, you take every opportunity to bestow your handiwork on family and friends. And being accosted by an eager photographer in search of an audience can be an experience, to say the least.

"Hey, you've just got to come over and look at some of my new stuff," was an invitation I received recently from a friend, also a photographer. It sounded more like a command, with no chance for R.S.V.P.ing.

So first came the color slide show. Then he said, scarcely pausing for breath, "Now I'll show you some really *fantastic* black-and-white." I kept my eyes glued to the screen, but it didn't light. Instead, a ragged yellow enlarging paper box appeared from under a nearby coffee table, and prints flew about like snowflakes in a whirlwind.

"Why didn't you include these in your slide show?" I asked.

Looking at me as if I were a dummy, he managed to say through a snicker that "These aren't slides; they're black-and-white!"

"But you can *make* them into black-and-white slides."

"Huh?"

"And it's simple. And you might even like them better than your prints." So I began to explain.

There are basically three ways to produce black-and-white transparencies.

1. Photograph on fine-grain, black-and-white film and use a relatively complicated process for reversing the film to a positive transparency.
2. Make prints normally, and copy them on a copystand with fine-grain black-and-white film, reversing it via the same complicated process; or make your copies with a reversal-type color transparency film, an expensive approach that can, in fact, degrade rather than enhance quality.
3. Photograph the original scene on your regular black-and-white film and copy the negative by means of a slide duplicator onto High Contrast Copy Film.

I have been able to adapt the third alternative to my needs quite successfully with a Nikon bellows and slide copying attachment to produce positive black-and-white transparencies with real fidelity. The copied negatives have extremely high resolution, add no recognizable grain to that of the original negative, and actually seem to offer a wider range of tones than can be obtained by the enlarging and printing procedure. The result: deep blacks and brilliant whites—both containing detail.

The increase in tonal range results when the copy film, designed to give high-contrast results, is developed as a *normal* negative film. Its inherent wide latitude lets it thus record a broader range of density than the original. Enlarging paper, on the other hand, has a narrow contrast range, which is why the paper is supplied in contrast grades.

Being able to shoot with my regular black-and-white film arsenal is a definite plus. I am more familiar with the way each emulsion works in specific photographic situations—such as flat available light or harsh sunlight. I can mix film speeds, emulsion types, and developing agents at will. I can push my regular Tri-X extremely far, should it be necessary, with predictable results. High Contrast Copy film has necessarily high resolution and almost nonexistent grain. Join that with development for more normal contrast, and you have qualities that in some cases seem to surpass the original negative.

There are several slide duplicators available that will allow you to use your 35-mm SLR camera and normal lens with it. They range in price from about \$20 to more sophisticated units selling for several hundred dollars. The Nikon close-up bellows and slide copying attachment I use has a list price of about \$180. Most copiers offer a means of varying the degree of enlargement. An



Copying your negatives with slide duplicator and Kodak High Contrast Copy film enables you to create positive b&w transparencies.

important feature to consider in any slide copier is off-center cropping. For example, the copier may allow for different degrees of enlargement, but limit enlarging to the center of the frame.

When copying, a behind-the-lens meter in the camera will best determine exposure. For a high-contrast negative, the copy film is normally rated at 64 and developed in Kodak D-11. It is designed for copying flat line copy. But when the speed is lowered to 12 and the film developed in regular developer such as Kodak D-76, it produces the contrast range necessary to duplicate the negative as a very high-quality positive.

Exposure should be bracketed by one f-stop over and under the meter's reading. The varied exposure will not affect the contrast appreciably, but will give you an aesthetic selection of densities. Unlike printing, the picture cannot be pulled out of the developer when it is "dark enough." Nor can you burn, dodge, or bleach. (This technique is good . . . but it's not perfect!)

The copy film will probably develop satisfactorily in your usual developer. Developing time, however, will have to be determined by experimentation. I develop in D-76 for 6 minutes at 70 F with constant agitation. Contrast may be increased or decreased by over- or underdeveloping.

After developing and drying, transparencies can be mounted in cardboard or plastic mounts and projected along with your color slides. 

35-MM PHOTOGRAPHY



Author placed negative of backlight scene into slide duplicating setup—Nikon loaded with Kodak High Contrast Copy film, bellows, and slide-copying attachment—shown at left, to produce a 35-mm positive transparency. High Contrast Copy film was processed “normally” in D-76, then placed into 35-mm slide mount, ready for projection.

THE COLOR PRINTER'S BIBLE

A rainbow of facts about the craft of color printing

By BOB NADLER

This special section is the first in a series of articles on the craft of color printing that will appear in 35-MM PHOTOGRAPHY. *The Color Printer's Bible* will be published in book form by Amphoto, Garden City, N.Y. All material, copyright © 1976 by Bob Nadler.

The additive primaries

Any hue known in nature can be stimulated in human perception by a mixture of two or more properly chosen colored lights. But rich, "saturated" colors require three lights. Color photography is actually based on mixing light of three different colors: red, green, and blue.

The eye's three color channels are tuned to receive and transmit the colors red, green, and blue. So is every color film, paper, or any other photographic media anyone presently manufactures. These three colors are called the *additive primaries*. The reason for this name is quite simple. The only way that any one of these colors can cause your eye to see anything but its own color is if it is mixed (added to) in some part with radiation of the frequency of another of the additive primaries. If that is less than clear, try this: in order to see yellow, your eyes will have to be stimulated with *both* a source of green *and* a source of red light. (The yellow portion of the spectrum is so narrow that spectrally pure yellow is seldom ever seen in nature, except for that which occurs in rainbows.) To be of any intermediate-color forming use, the additive primaries must be added, one to the other. The proper addition of the three additive primaries can fool your head into thinking that it is seeing any

color at all, even the ones, such as magenta and cyan, which don't occur in nature's spectrum. To do this fooling, however, separate sources of these additive colors are required to stimulate the eye/brain into seeing the synthesized color.

It may be clearer if you will consider that a red filter placed in a beam of white light will block all radiation except that in the red frequencies (see fig. 1). Similarly, a blue filter blocks everything but blue light and a green filter stops everything but green light from passing through it (see figs. 2 and 3). Each filter of an additive primary color manages to block two-thirds of the visible spectrum from passing through itself.

If a red filter blocks everything but red light from passing through it, it shouldn't be too hard to comprehend that if you place a light behind a red filter and then place a green filter in front of the red one, no light will manage to get through the pair of filters at all. The light's white light will first encounter the red filter, and that filter will absorb all of the spectral frequencies but those of red. The red light will leave the red filter and encounter the green filter. Since the green filter absorbs all spectral frequencies except green, it will absorb the red light and pass nothing through to the eye.

So any combination of two filters of the additive primary colors—red/green, red/blue, green/blue—placed over a single source of white light will absorb all of the light and allow you to see nothing (fig. 8). But, as mentioned earlier, if a red filter is placed over a single light and a green filter is placed over another light,

and both lights are of equal intensity and are shined at the same spot on a screen, you will see the result of these two colors being added (within the eye/brain combination)—you will see a yellow spot on the screen (fig. 5).

I think it will be easy to see that dyes of these additive primary colors are useless for the formation of photographic images as there is only a single source of white light available for viewing such images: slides are viewed by the light of a single projection lamp, prints are seen by the white light that passes into the print from above and is reflected to the eye from the print's white paper base.

The way that the additive primaries are used in color photography is actually very similar to the way that nature seems to use them in allowing humans to see colors; *the additive primaries are the colors to which film and paper are sensitive*, just as they are the colors to which the human eye is sensitive, but the dyes within any photographic image are of another set of colors entirely.

The subtractive primaries

The *subtractive primaries* are those colors that result from mixing equal



A reflex, condenser-type enlarger employs a mirror at a 45-degree angle to both the lamp and the condensers to direct the light down, through the filter drawer, through the condensers, and to the negative stage. I've removed the heat-sink top and the 45-degree mirror from this machine to illustrate the component arrangement. The filter drawer is pulled halfway out to reveal the condensers below it.

amounts of any two additive primaries. Separate and equal sources of red and blue light blended on a screen are perceived as the subtractive primary called magenta. A mixture of equal parts of the additive primaries blue and green yields the subtractive primary called cyan. A blend of equal parts of red and green cause the perception of the subtractive primary called yellow. The wonderful thing about these subtractive primary colors is that they are only half as greedy as the additive primary colors. A filter in any of the additive primary colors will absorb two-thirds of the spectral frequencies of white light, allowing only the third containing its particular color to pass. However, a filter of any of the subtractive primary colors will absorb only about one-third of the spectral frequencies of white light. The third that they do absorb is perhaps the most wonderful thing about these peculiar colors (which only interior decorators and photographers can love).

Each of the subtractive primaries removes (subtracts) one of the additive primaries. The additive primary it subtracts is called its complementary. Just as in the case of a black-and-white

negative, where the black portions of the negative will print as white highlights on the paper and the clear (white) portions of the negative will show up as black sections of the print, a cyan portion of a negative will show up in its complementary color, red, on the print. But I'm afraid I'm getting a bit ahead of myself.

The various sets of complementaries are red/cyan, blue/yellow, and green/magenta. A cyan filter will pass green and blue, but hold back red (fig. 9). A yellow filter will pass green and red, but hold back blue (fig. 11). A magenta filter will hold back green but pass red and blue (fig. 10). And these wonderful subtractive primaries don't require separate sources of light, white or otherwise, to do their thing. They are perfectly happy to subtract their complementaries from a single source of light.

Now we are getting somewhere. These peculiar-colored dyes are nicely suited to making photographic images.

If you will recall my earlier statement, you will see that we are able to produce any color at all by stimulating the eye's receptor channels with various combinations of the additive primaries.

Since the subtractive primaries can be used to control accurately the mixture of additive primaries *in any single source of light*, it follows that by controlling only three layers of dye, one in each of the subtractive primary colors, we can manipulate the additive primaries and cause the eye to perceive any color at all.

A bit more explanation is in order here. A filter has two principal properties: its color and its density. We have been discussing color up to now, but as yet we have said nothing about density. If a filter is made with a little bit of dye of a pure magenta color, it will have a pale magenta appearance and will absorb only a little of the green component of white light. If the same filter is made with a great deal of magenta dye, it will have a deep magenta appearance and will remove a great deal of the green component of white light. The same, of course, is true for filters of the other subtractive primaries. Later, when I get into the use of subtractive primary filters for controlling your enlarger's white light output, I will mention conventional filter densities of .05 to .40 for the standard acetate color printing (CP) filters most often used in color printing. I mention these here just to give you some idea of the amount of subtracting power of such filters. For instance, a .50 magenta filter will subtract about 70 percent of the green content of the white light passing through it. An .05 magenta filter, on the other hand, will only remove about 20 percent of white light's green component. So much for dye density. On to neutral density.

It may not have occurred to you, given the turgid nature of my prose style, that it is possible to stack several of the subtractive primary filters together to remove more than one additive primary component of white light. However, doing so is entirely possible. You can place a cyan filter over a beam of white light and remove some or all (depending on the cyan filter's density) of the beam's red component. If you then place a magenta filter on top of the cyan one you can also get rid of the beam's green component, and finally, if you place a yellow filter over the other two you will get rid of the beam's blue component. Now, if you get rid of red, green, and blue (as in fig. 12), what do you have left? Nothing, as far as our peculiar eyes are concerned. And what does nothing equal in any discussion of color? Neutral density is what nothing equals. A much simpler and more readily



A condenser/diffuser conversion has been made on the enlarger shown here. It began life as a Beseler 23C with the condensers and lamphouse shown lying on its easel. The conversion was made by removing these components and slipping the rather large Dichro 23dga color head onto the machine. The entire procedure took less than 5 minutes the first time, and now takes 2 minutes.



You needn't stick to one manufacturer's products to fill your filtration needs. This is a set of 3x3-inch acetate CP filters produced by Unicolor, a CP2B made by Kodak (and cut down, with a pair of scissors, to the 3x3-inch size of the filter drawer) and a heat-absorbing glass (HAG) made by Durst for its own enlarger.

COLOR PRINTER'S BIBLE

understood term for neutral density is black. Black is the absence of any light. However, neutral density, as all you users of neutral density camera filters well know, comes in various densities, too. Neutral density starts where white leaves off and goes through increasingly darker shades of gray until it hits its maximum density; no light, of any color at all, can be transmitted through it. It is always this absence of light that forms the "color" black (figs. 13, 14, and 15).

How color films are designed and operate

Perhaps the easiest way to think of color film is as three layers of Plus-X glued together. While that is a gross simplification, it is not too far from being the case. Color film has three separate and distinct silver-halide emulsion layers, one on top of the other, all sitting on one layer of plastic film base. But, unlike the Plus-X emulsion, which is panchromatic (it responds to all of the colors of the visible spectrum, more or less equally), each of the emulsion layers on a piece of color film are essentially monochromatic (they respond to one, or mostly to one, color alone). The reason for this construction—it's the same, by the way, for almost all color materials (except Cibachrome, which I'll get to later) whether they're color printing papers, transparency film, reversal color papers, etc.—is that in photography there are only three different dye colors that are used to reproduce any and every color. Those dye colors are the subtractive primaries, cyan, magenta, and yellow.

The basic scheme employed is such that each of these three emulsion layers is specifically designed to respond to exposure by light of one of the additive primary colors. The topmost emulsion layer is sensitive to blue light. The center emulsion layer responds to green light and the bottom emulsion layer records a latent image when exposed to red light. The effect of light on the emulsion layers is exactly the same as it is in black-and-white photography. Each layer of emulsion that receives exposure is left with a latent image in its silver-halide. It is not until after further film processing that any dyes are formed.

In addition to silver halides, each emulsion layer (except in the case of the Kodachromes, which have both their couplers and their dyes added during processing), has chemical substances

called couplers incorporated in them. The purpose of these couplers is to react during one of the chemical processes of development to form dye selectively. For example, where the middle emulsion layer of a color negative film receives exposure from green light and records a latent image in the silver halide, development will reduce that silver halide to metallic silver (just as in black-and-white film) while at the same time oxidizing the developer. The coupler in the center emulsion layer then reacts with components of the oxidized developer to form magenta dye, in direct proportion to the amount of green-light exposure the emulsion originally received. Some couplers are also used to form a printing mask (the orange or deep-yellow color) in color negatives. This will be explained more fully later.

All color films incorporate some kind of anti-halation layer. It is provided to insure that any light that manages to reach the film base will not be reflected back up through the emulsion layers. The anti-halation layer can absorb all of the radiation of the visual spectrum.

I should also mention that there are gelatin layers between each emulsion layer. They are there to separate mechanically and chemically the emulsion layers from one another. However, the gelatin layer between the uppermost (blue-sensitive) and middle (green-sensitive) layer also serves as a

yellow filter. I'll get to the reason for that quite soon. The yellow dye incorporated in this layer washes out during the film processing, leaving this gelatin layer, too, with only its role as a separator once the film has been processed.

In addition to all of these layers, many films also incorporate a topmost layer of anti-scratch material that helps to protect the tender emulsion layers below it from mechanical damage during the film's transport through the camera.

How color printing papers are designed and operate

The major difference between the structure of color film and color paper is that the emulsion layers of the paper material are supported on a layer of opaque, highly reflective, brilliant white paper, instead of on a transparent plastic material as is the case with color films. The reason for this, of course, is that color printing paper is designed to yield an image that will be viewed by reflection, rather than by transmission. Another important difference between film and paper is that the emulsion layers are ordered differently in color papers meant for use with color negatives. Color negative printing papers have their emulsion layers arranged so that the uppermost layer is sensitive to red, the center layer is sensitive to green, and the bottom layer responds to blue. Reversal papers, which are used to make prints directly



Filters designed to remove infrared and ultraviolet come in a wide variety of sizes, materials, and spectral absorption/transmission characteristics. The small, 2-inch-square glass filter balanced on the back flange of an enlarger lens is a 301A. This location is not the best one possible, but it allows the use of a small (inexpensive) filter.

"The eye's three color channels are tuned to receive and transmit the colors red, green, and blue. So is every color film, paper, or any other photographic media anyone presently manufactures."

from slides—such as Kodak's 1993 and R-14 and Cibachrome's several papers—have their emulsion layers ordered the same way that film does, with the top layer responding to blue light, the center layer sensitive to green light, and the bottom layer responding to red light.

There are two principal types of color printing papers designed for producing images from color negatives. These are called, simply enough, type A and type B. From a practical point of view, the difference between the two types is that the type B paper can be evaluated for print color balance while the print is wet, but type A prints must be dried before this evaluation can be made. From a structural point of view, the difference lies in the way the couplers are incorporated in the paper's emulsion layers. Type A papers incorporate their couplers encapsulated in tiny oil globules, which are dispersed throughout the emulsion layers. Type B papers keep their couplers from wandering between emulsion layers and from interacting with the silver halides by attaching the coupler molecules to large organic groups. Another practical material consideration, among the several color printing paper materials, is the paper's base itself. There are, presently, two different principal types of paper bases available; baryta (barium sulfate) coated and resin (plastic) coated. Most type B papers are of the former type, while most of the type A papers are plastic coated.

Plastic-coated papers are easier to wash, quick to dry, and lie flat after drying. Baryta-base paper is somewhat less expensive and can provide a surface that, when air dried, is far better than anything I have seen on

resin-coated materials. However, I must admit that I've all but given up using the baryta-base material (with which my freezer is still well stocked) because of the ease of working with the plastic-coated papers.

The structure of the entirely plastic-base Cibachrome color printing "paper" is so different from all of the materials discussed here that it will be taken up separately elsewhere.

How a latent image is recorded

In order to understand how color relationships are manipulated to achieve a color print, the most logical place to begin is with the generation of a color negative. Fig. 18 represents a cross-sectional view, greatly magnified, of a piece of tri-pack color negative film being used to take a picture of a section of board fence. The first board visible on the left side of the viewfinder is painted matte-black. The board adjacent to it is painted red. The next board is green. The next is blue. The final board, visible on the right side of the viewfinder, is white.

The light reflected off the board is focused on the film plane. The first emulsion layer it strikes contains silver salts sensitive to blue and violet. The silver salts are affected where this emulsion layer is struck by the light coming from the blue painted board; the intensity of the blue light is diminished as its energy is consumed in the photochemical reaction, causing the silver salts in this layer to begin to be reduced to metallic silver. Note that there is also a reaction in this emulsion layer where it is struck by light from the white board. White light contains equal parts of red, green, and blue light, and its blue component is diminished as it affects this layer of emulsion. Since this layer is insensitive to the colors red and green, light from the red and green boards will cause no changes. Obviously, there will also be no effect from the black board—black being the absence of light rather than a color.

Layer number two consists of a gelatin containing yellow dye. This layer is nothing more than a yellow filter. Yellow, being the complementary of blue, effectively eliminates any blue light that has passed through the first blue-sensitive layer. Complementary colors, you will recall, yield neutral density (shades of gray through black). Layer number 3, which is sensitive to both green and blue, must not receive blue light. The yellow layer effectively blocks blue while allowing red and green

light to pass through unaffected. Layer number 3 now records the image of the green board and the green component of the image of the white board. In doing so, it reduces the intensity of the green light that passes through it and on to layer 4. The red light passes through layer 3 undiminished.

Layer number 4 is simply clear gelatin, used to separate emulsion layers 3 and 5. It has no effect on the light passing through it.

Layer number 5 is sensitive to red and blue, and very slightly to green. As all of the blue light has either been absorbed or filtered and most of the green light has been absorbed, only the image of the red board—and the red component of the white board—will be recorded in this layer.

Layer 6, the film base, is a transparent plastic, and serves only as a mechanical support.

Layer 7 is an anti-halation backing that serves to absorb any light energy that has gotten through, preventing this light from being bounced back up through the layers to cause multiple images and/or fog.

How latent image is developed

If you have been making references to Fig. 19A, while reading the material above, you will have noticed a column of information labeled, "Dye Color After Development," about which I've said nothing as yet. This data simply indicates the color of the dye that will be deposited in each of the emulsion layers during the development process. This is a horrendously complicated chemical procedure; briefly, couplers incorporated in each layer of the film's emulsion will selectively combine with the products of oxidation that result when you develop the exposed silver salts. The amount of dye so deposited will be in direct proportion to the amount of exposure received by the emulsion. The couplers not only insure that the right color dye is deposited in the appropriate emulsion layer, but also form a printing mask, which gives most color negatives their characteristic orange color. (I'll explain masking later.) Once the dye is deposited, all metallic silver and silver salts are removed by bleaching and fixing.

A glance at Fig. 18 will show that in emulsion layer number 1, which is used to record the blue image, yellow dye will be formed after development. Yellow, of course, is the complementary of blue; remember, this is a negative we are making. Similarly, magenta—green's

COLOR PRINTER'S BIBLE

complementary—will be deposited in the green-sensitive layer 3, and cyan—red's complementary—will be deposited in red-sensitive layer number 6.

How negative image is printed

Fig. 19 shows our negative of the multi-colored fence, emulsion-side-down, in an enlarger. A sheet of color printing paper is shown below it in position to be printed. Below the cross-sectional views of the film and paper is an additional cross-sectional view of the paper's dye layers after development, and a plan view (looking down at the emulsion side) of the paper as it will appear after development. You will note that the topmost film layer illustrated is number 6, the film base (the anti-halation layer is dissolved and removed during film processing). White light from the enlarger lamp is shown falling on the film base. Since the film base is clear, the white light passes through unaffected.

Film layer 5 is now a dye layer, containing two sections of cyan dye, which controls the exposure of the red-sensitive emulsion of the printing paper. Where the white passes through these cyan dye deposits, the red component is filtered out (cyan being red's complementary color), leaving only the green and blue components to pass through to film layer 4. (For the moment, let's ignore the asterisks shown below this layer. We will return to them later.) Film layer 4 is clear gelatin and does not affect the light passing through it.

Film layer 3 is responsible for controlling the exposure of the green-sensitive emulsion of the printing paper. It contains two magenta sections, which remove the green component of the light that passes through them.

Now, let's stop and look at the light that falls on layer 2. The first pair of arrows on the left (section 1) are shown as white light, since these have not passed through any dye deposit to this point. The next pair of arrows (section 2) are labeled green + blue, because the white light these arrows started out as has passed through cyan dye in film layer 5. The next pair of arrows (section 3) are shown as red + blue, because their original white light has passed through magenta dye in film layer 3. The next pair of arrows (section 4) are indicated as white light, because they have not passed through any dye at this point. The final three arrows (section 5) on the right are labeled blue. This is

because the white light from which they originated has passed through cyan dye in film layer 5 (where the red component was lost) and magenta dye in film layer 3 (where the green component was lost). Once again, I have ignored the asterisks. We will return to these as well later.

Layer 2 is the gelatin that contained yellow dye before development. It is now quite clear, as all of its yellow dye was removed in the development process. Therefore, the light reaching film layer 1 is unchanged from that which falls on film layer 2. Film layer 1 is responsible for controlling the exposure of the blue-sensitive emulsion of the printing paper. It contains two contiguous sections of yellow dye, which will remove the blue component of light that passes through them. The light that leaves film layer 1 is that which now passes through the enlarger lens and falls on the printing paper.

The printing paper consists of three layers of silver salt emulsion, each layer being sensitive to only one of the three additive primary colors. (There are also two thin layers of clear gelatin separating the emulsion layers; they have been omitted from the illustration for clarity.)

The first emulsion layer on the printing paper is sensitive to red light. Where this layer is struck by light containing a red component, silver salts will begin to be reduced to metallic silver. Thus, the red

latent image will be recorded, while the intensity of the red component of the impinging light will be diminished as its energy is consumed in the photochemical reaction. Fig. 19 illustrates this effect in the first, third, and fourth sections of paper layer 1.

Paper layer 2 will record a latent image of any green light that strikes it, while diminishing the intensity of the green light causing the latent image to be formed. This effect will be noted in the first, second, and fourth sections of paper layer 2. Now, all of the red light having been absorbed in paper layer 1, and all of the green light having been absorbed in paper layer 2, only blue light remains to fall on paper layer 3.

Paper layer 3 records a latent image of the blue component in its first, second, and third sections.

The process of development of color paper is essentially the same as that of color negative film: cyan dye is deposited where the latent image of red was formed, magenta dye is deposited where the latent image of green was formed, and yellow dye is deposited where the latent image of blue was formed. The brilliant white color of the paper base, paper layer 4, is not affected by development.

The bottom sections of the illustration show the appearance of the printing paper after development. It must be understood that a developed color print is viewed by observing light that is first



Dichroic filters are expensive and they must be accurately positioned in the enlarger lamp's path. Small dichroic filters are attached to each of the three cam-follower plates shown. The plates are positioned by knobs external to the enlarger head to bring the filters into the small square opening directly below the lamp. A cooling fan can be seen at the left of the lamp. It dissipates the heat produced by the high-powered tungsten-halogen lamp.

"Color film has three separate and distinct silver-halide emulsion layers, one on top of the other, all sitting on one layer of plastic film base."

transmitted through the three dye layers, then reflected back from the white paper base through the three dye layers to the eye. With this in mind, let's view the developed print of the multi-colored fence.

Light enters section one and passes through dyes of the three subtractive primary colors (cyan, magenta, yellow). You will recall that three subtractive primaries form neutral density; therefore, no light will reach the paper base in this section to be reflected to the eye. Section one will appear black.

In section two, light must pass through magenta and yellow dye layers, then be reflected back through these dye layers on the way to the eye. Therefore, red is the color this section will appear to be.

In section three, the light must traverse yellow and cyan dye layers twice on the way to the eye. This section will then appear to be green.

In section four, light must make two passes through cyan and magenta dye before being seen as blue.

Finally, in section five, it will be seen that as no light at all fell in this section of the printing paper under the enlarger, no latent image was formed, and no dyes were deposited in development. Therefore, the light reaching the eye from this section of the developed paper is only that which is reflected unfiltered from the paper base. It will appear white.

Now, let's go back to those asterisks—you remember, the ones that I did not stop to explain. Reference to the illustration will show that I have indicated small losses of blue and green light to all of the light component arrows that have passed through film layer 5, the cyan dye layer. These losses are brought about by the deliberate incorporation of colored couplers, which

remain in this layer after development and color the layer red wherever no cyan dye is formed. This is done by the film manufacturers to compensate for unwanted green and blue absorption by the cyan dye. In the same manner, small blue losses caused by the magenta dye are compensated for by incorporating colored couplers in film layer 3, which color this layer yellow wherever no magenta dye is formed in development. Therefore, asterisks indicate small blue losses to all of the light passing through film layer 3. The combination of the red and yellow masks is responsible for the overall orange appearance of color negatives.

How a latent image is recorded

If you've come this far, the deviousness of the color reversal process won't faze you one bit. But if you have simply dipped into the text at random and come to a stop here . . . good luck.

The structure of a color transparency film is, for all intents and purposes, identical to that of a color negative film, with one or two serious differences. The first and most obvious difference between color negative and color positive film is that the color positive material (transparency film—the stuff you make your slides on) doesn't incorporate the colored couplers that result in an orange printing mask after processing. Transparencies are intended for direct viewing over a "white" light source. It is this direct-viewing requirement that brings me to the second major difference between the negative and positive materials. The dye density of a transparency material must be twice as great as that of a print. This is so because a print is viewed by white light that has two passes through the dyes (not a single pass as is the case with transparency materials), once on its way to the paper base and once on its way from the white paper base to the viewer's eye. A dye-density change in a negative will yield twice the effect in a print.

Aside from these differences, most color negative and color transparency film are very much alike. Except for films of the Kodachrome type. These differ because they do not have any couplers incorporated in their emulsion layers. Instead, both the couplers and the dyes are added to the film during its processing. (The processing of the Kodachromes is also quite different from those used for other films.

I will get to it shortly.)

If fig. 20 looks strangely peculiar, it is because the upper portion of the diagram is identical to the drawing I used to illustrate how the latent image of a multi-colored board fence is recorded on color negative film. The latent image is formed identically for both color negative and color positive materials. It's what comes next that is so tricky. If you have read through the explanation of how a color negative is formed, you know that the color developer reduces the exposed grains of silver halide to metallic silver. In so doing, the developer is oxidized and color dyes are formed in proportion to the amount of oxidized developer. You also know that the result of this process, once the remaining silver is removed and the film washed, is a negative image. Where the subject was red, the negative will be cyan; where the subject was green, the negative will be magenta, and where the subject was blue, the negative will be yellow. That's fine for a negative, the colors of which are again reversed during printing, but it doesn't quite make it for an image that must be viewed directly.

How latent image is developed to positive transparency

To solve this knotty problem, let's consider what would happen if I simply developed a piece of color-positive film, with a latent image of the black, red, green, blue, and white boards of a board fence, in a simple black-and-white developer. I would have metallic silver wherever the emulsion's silver-halide particles had been exposed to the color of light they were sensitive to, and unaffected silver halide wherever there had been no exposure. In essence, I would have a metallic-silver negative image and a silver-halide positive one. Now, here is where I get devious. Supposing that after producing this metallic-silver negative, I now re-expose the piece of film to strong white light. If you will think about it for a moment, you will see that what I am doing can be likened to making a sort of "contact print" using the metallic silver as the negative and the previously unexposed silver halide as the "printing paper." O.K., so now I have a metallic-silver negative and a latent positive image. Continuing down my devious path, I put the film into a color developer that reduces the silver halide of the latent positive image to metallic silver and forms dye, which is coupled wherever such a reaction is taking place. In this

COLOR PRINTER'S BIBLE

way, I will produce a color positive *only* in the re-exposed areas. This is so because the negative image was reduced to metallic silver in the black-and-white developer, so the color developer has no effect on it and no dyes at all are deposited in the metallic-silver negative portion of the image. After the color development step, the film is further processed to remove all of the metallic silver, both that of the negative image and that which was

formed while developing the positive image, and all that remains to be seen are the dyes forming a proper, positive image.

The white-light re-exposure previous to color development is still a feature of such processes as Kodak's E-3, GAF (all), Unicolor's Unichrome, and others; however, the re-exposure step can conveniently be carried out chemically as well, with a strong fogging agent, as it is in Kodak's E-4 process.

The Kodachromes are not simply re-exposed to white light, or chemically fogged, as are other color-reversal films, after the initial black-and-white development. Instead, two of the three emulsion layers must be separately re-exposed to the color of light that they were designed to respond to in the camera. After each re-exposure, the re-exposed layer must be separately processed in a bath containing both the necessary couplers and the dye required for that layer. The entire operation is carried out automatically in a processing machine.

First the bottom, red-sensitive layer is re-exposed to red light. This layer is then color-developed in cyan-coupled dye. The film then continues on through the automatic machine, where the top, blue-sensitive layer is re-exposed to blue light, then processed in yellow-coupled dye. Finally, the machine carries the film to a bath containing magenta-coupled dye, which reacts directly with the remaining silver halides in the middle, green-sensitive layer.

After all three layers have been selectively re-exposed and/or processed, all the remaining metallic silver is removed and the film is dried and cut. This is hardly the sort of operation that can be carried out in a simple home darkroom. It takes a very complicated setup to handle the physical and mechanical requirements, and the chemical and temperature controls involved are too demanding for anything but fully automated equipment.

How a transparency is printed on color-reversal paper

There is very little difference between making a color transparency in the camera and making a reversal color print on the enlarger easel. But fig. 21 does show one physical difference in the finished products of each process quite clearly. The densities of the dyes in the print are only half that of the dye densities of the transparency. You will recall that a slide is viewed by light that makes only one pass through the

dyes—from behind the transparency, through the dyes and to the eye—while a print is viewed by light that enters from above, passes through the dye layers, bounces off the white paper base, passes through the dyes again, and finally emerges from the surface of the print and travels to the eye.

Fig. 21 shows our slide of the black, red, green, blue, and white board fence, placed emulsion side down, in an enlarger. White light from the enlarger's lamp shines through the transparency and is modified by the dyes in it.

There is no dye at all in the section carrying the image of the white board, so white light shines right through that section and emerges as unaffected white light on the other side of the transparency.

The section of the transparency carrying the image of the blue board contains highly saturated cyan and magenta dye. The white light, passing through these dye layers, loses its red and green components, so that only blue light emerges.

The section of the transparency carrying the image of the green board contains saturated cyan and yellow dye layers. These absorb the red and blue components of the white light from the enlarger lamp and allow only green to pass.

The section of the transparency carrying the image of the red board contains saturated magenta and yellow dye layers. These absorb the green and blue components of the enlarger lamp's white light and allow only red light to emerge.

The section of the transparency carrying the image of the black board contains saturated cyan, yellow, and magenta dye layers. These absorb all of the white light from the enlarger lamp and allow no light at all to pass through.

The focused image of the board fence is projected onto a sheet of reversal printing paper, where the several colors expose the emulsion layers sensitive to them to form a latent image of the fence.

How latent image is developed to a positive print

Once again, as in the case of producing a positive color transparency, the processing involves two separate development stages. First, the negative image is produced by developing the reversal color printing paper in a black-and-white developer. This renders the negative image in metallic silver and leaves the silver halides unaffected wherever no image is formed.



Constant voltage transformers are heavy, heat up, and emit a 60-cycle hum that can drive you nuts in a quiet darkroom. But, especially for printing color negatives, they are often a darkroom necessity.



The GraLab timer is as much at home on the wet side as on the dry side of a darkroom. Because it offers up to 1 hour of controlled interval timing and its huge, luminous dial is easily readable in the dark, it is a favorite with many darkroom workers. Color print processing becomes semiautomatic when a motor base with daylight print processing drum on top is plugged into a GraLab timer/enlarger outlet.

"An internegative is made by photographing the positive image, on the transparency, on special internegative film stock ... using a tungsten (3200 k) source of illumination."

This step is followed by a re-exposure of the paper to white light (or to chemical fogging) and then color development. The re-exposure, once again, as in the case of a positive color transparency, acts to sort of "contact print" the negative metallic-silver image, using the remaining silver halide as the "printing paper." The latent positive image formed in the remaining silver halides is then reduced to metallic silver by the color developer. The color developer is oxidized by the process and its oxidation causes dyes to be formed of the couplers incorporated in the paper's emulsion layers. Each layer's coupler will form a dye only of the color appropriate to that layer.

At the end of the color development process, all of the silver halide in all three emulsion layers has been reduced to metallic silver, either by the first black-and-white developer or by the color developer, and the transparent dyes are formed and are coupled in place.

The paper is now bleached and fixed (usually in a single step) to remove all of the silver. This leaves only the dye image of the multi-colored board fence.

How positive-to-positive dye-bleach system works

Until now, all of the film and paper I have discussed has been of the chromogenic type; that is, the materials themselves contained only silver salts and couplers, and the dyes were formed in the processing of these materials. There is, however, another process, called dye-bleach, which is used in the widely available Cibachrome materials. All of Cibachrome's products are reversal materials—they are all used for making positive-to-positive images.

Ilford, the company that markets these materials, offers both transmission and reflection media, for making transparencies and prints, respectively. Both types of materials work essentially the same way, utilizing the dye bleach technique.

Cibachrome printing materials leave the factory with all the dye they will ever have—three layers of it, in cyan, magenta, and yellow, arranged in the same order as the dye layers that form in the processing of the chromogenic materials. But, unlike the chromogenic materials, where you form dye in processing, with Cibachrome, you actually remove dye from the printing materials when you process. Fig. 6 illustrates the construction of Cibachrome's CCP-D 182 professional printing "paper." (I've put paper in quotes because there is no paper at all in Cibachrome's reflection printing material. The base of this stuff is entirely made of triacetate plastic.) Cibachrome has even more layers than the chromogenic print materials do. Starting from the top, there's the anti-abrasion layer, which serves no image-forming function at all. It is there only to protect the paper from mechanical abrasion and is removed in processing. The layer below it, labeled SH-Y, contains silver halide that is sensitive to blue light. The YD layer contains fully saturated yellow dye and additional blue-sensitive silver halide. The YF is yellow-dyed gelatin, which serves as a filter to absorb any blue light that penetrates this far. The SH-M layer contains silver halides that are sensitive to green and blue light. The MD layer contains fully saturated magenta dye and additional green/blue-sensitive silver halides. The G layer is a simple gelatin layer that

serves to separate the MD and CD layers. The CD layer (no, I haven't made a mistake; the CD layer is above the SH-C layer, in spite of the opposite arrangement used for the other two dye/halide-layer pairs) contains fully saturated cyan dye and some red/blue-sensitive silver halides. The SH-C contains silver halides that are sensitive to red and blue light. Finally, the B layer is the white, opaque, triacetate base upon which this entire edifice rests.

How the Cibachrome dye-bleach process works

While the structure of Cibachrome's printing material looks quite complicated, the procedure used for processing it is, in essence, delightfully simple.

To illustrate it, in fig. 22, I have put my slide of the black, red, green, blue, and white board fence in the enlarger's negative carrier, put a sheet of Cibachrome's CCP-D 182 printing material on the easel to make a printing exposure. The dyes in the slide remove the various components of the enlarger's white light, as illustrated, and a latent image of the fence's board is duly recorded in the appropriate emulsion and dye layers. The white-light portion of the image leaves a latent image in all of the silver-halide layers and in the silver halide dispersed in all three of the dye layers. The blue board's image is recorded in the blue-sensitive, silver-halide layer above the yellow dye layer, and it is also recorded in the silver-halide grains within the yellow dye. The green board's image is recorded in the green-sensitive silver-halide layer immediately above the magenta dye layer and it also leaves a latent image in



Regardless of what kind of enlarging easel you may have, if it isn't already black, paint it matte black.

COLOR PRINTER'S BIBLE

the silver-halide particles in the magenta dye layer. The red light, carrying the red board's image, manages to leave a latent image in the red-sensitive silver-halide grains in the cyan dye layer and get through the cyan dye to be recorded by the silver-halide particles in the red-sensitive emulsion layer immediately below it. I know that up until now I have categorically stated that cyan absorbs red, and that according to my preachments no red light should be able to get through the fully saturated cyan dye layer to reach the silver-halide layer below, but . . . those clever Swiss gnomes (Ilford is owned by Ciba-Geigy, a Swiss concern) have deliberately mismatched the peak spectral absorption characteristics of their cyan dye and their red-sensitive emulsion, to make this seemingly impossible feat into an everyday occurrence. (In case you are wondering why the cyan dye layer and the red-sensitive silver-halide layer are reversed, when compared to the other two dye/halide-layer pairs, it is to allow the makers to keep the total emulsion coating thickness to a minimum and thereby increase the resolving capabilities of the material.)

These latent images are reduced to metallic silver in a black-and-white-type of developer and then in a dye-bleach processing step, the dye-stuff adjacent to the metallic-silver particles is removed. Subsequent processing removes all residual silver halide and metallic silver particles, leaving only three layers of dye.

Since the dye was removed wherever a negative image had been formed in the first development step, the dyes remaining form a positive image of the multi-colored board fence.

Positive-to-negative-to-positive printing

In the bad old days, before Kodak introduced Ektachrome RC paper, Type 1993 reversal color printing paper, and Ilford had their Cibachrome materials widely available on the market, there was good reason to make color prints from color transparencies via an intermediate image on a color negative. Today, in my very strong opinion, such a procedure is a complete waste of time, and will result in a print of lower overall quality than can be obtained by printing directly from the slide onto one of the new direct reversal materials. However, there is always someone in the crowd who wants to do things the

old-fashioned, if impractical, way, so I feel obligated to mention the internegative procedure here.

In those bad old days, if you had a slide you really wanted to make a high-quality print of, you really did have to make an internegative, because the reversal printing materials then available for working directly from the transparency, positive-to-positive, were not capable of delivering any real image quality. (An alternative procedure was to prepare three color-separation negatives and use the dye transfer process to make reflection copies. This procedure is beyond the scope of this series.)

There is still another, somewhat dubious, advantage to going this route to get from slide to print, and that is that black-and-white conversions are more readily and directly available from a color internegative than they are from a transparency. Black-and-white prints can be made directly from color negatives on special panchromatic black-and-white printing papers such as Kodak's Panalure.

An internegative is made by photographing the positive image, on the transparency, on special internegative film stock, such as Kodak's 6008 or 6110, using a tungsten (3200 K) source of illumination. The internegative film is then processed in modified C-22 chemistry. Once processed, it is printed as any other color negative would be. The special film and developer are needed to prevent excessive contrast in the internegative. Color problems, and to some extent, density problems, in the original transparency can be corrected by the use of color-correcting filters between the source of illumination and the slide, and by regulating the exposure of the internegative film. However, it is probably easier and more effective to do this kind of problem correction in the printing rather than in the making of the internegative.

Since the 6008 roll film is sold only in bulk (the shortest 35-mm roll is 80 feet), most photographers leave their internegative making to professional labs, which use the 6110 sheet film (4x5, 5x7, and 8x10 inches) sold in small quantities, or have Kodak make their internegative for them. (This is a normal, inexpensive, but somehow little-known service that Kodak provides and which is available through any corner drugstore dealing with them. Kodak made internegatives from 35-mm full- and half-frame slides are 2 1/4 x 3 3/4 inches.

They are 2 1/4 x 2 1/4 for most roll-film sizes.)

Once in hand, an internegative is dealt with just as any color negative would be. Fig. 19A illustrates the exposure of internegative film in the camera. Fig. 22A illustrates how a print is generated from an internegative.

Condenser enlargers

There are two basic types of enlargers available on the amateur market: the condenser and diffuser machines. The condenser type is designed to focus the light strongly from the enlarger lamp on its way to the negative. This type of machine is particularly effective for printing small-format (35-mm) black-and-white negatives, particularly dense ones. Unlike silverless color negatives, black-and-white negatives carry their images in metallic silver particles (the black portions of black-and-white negatives are black with silver grains). Because metallic silver grains have the ability not only to absorb, but also to scatter light rays trying to pass through them, the black-and-white printer often needs the extra zap a condenser machine can supply. The strongly focused light of a condenser enlarger has a better chance of getting through the silver thicket



A focusing aid is a necessity in the darkroom. The arrow-shaped unit in the foreground is a Unicolor-Mitchell screen focusing device. It permits sharp focusing of details at the extreme edges of an image. The object at left is a Rondo Dual-Image Focuscope, which is both a screen focusing and grain focusing device. The unit with a hole in its base is the Micromega. It will focus the grain anywhere in an image.

35-MM PHOTOGRAPHY

"Diffusion enlargers, designed specifically for color printing, employ light-mixing chambers between their lamp/filter compartment and the negative stage."

without undue diffusion. Stated most simply: you can get more contrast, in black-and-white printing, from a condenser machine than you can from any other type. It should also be noted that condenser enlargers are more efficient than other types, because they make good use of the enlarger lamp output, concentrating it directly on an area a bit larger than the format of the negative being printed.

Some condenser enlargers are designed to handle only one negative format. These machines employ fixed condensers. Other enlargers are adjustable to handle efficiently several different size negatives. These enlargers employ movable condensers, or provide for condenser interchangeability, to bring the diameter of the illuminating cone of light to the proper size for the negative being printed. Because condenser enlargers make such efficient use of their lamp's output, they are able to use low-wattage incandescent bulbs (designed to operate at a color temperature of between 2900 to 3200 K) and still provide fast printing speed. Because low-wattage bulbs (typically 75 to 150 watts) are employed, condenser enlargers are adequately cooled by means of conduction convection and radiation, without any need to resort to power-consuming, vibration-inducing, fan-forced air cooling.

So far, so good, but now we come to the one huge drawback that condenser enlargers have—their strongly focused light source faithfully reproduces every minute speck of dust and dirt, every negative blemish, every water mark; and they seem actually to take a special sort of perverse delight in clearly and accurately reproducing even the most minute of scratches on the negative. It is

because of this nasty property that the careful black-and-white printer makes very sure that his negatives are pristine before they get printed on his condenser machine. But even with the most elaborate of precautions, the photographic corollary of Murphy's Law states, "if there is but a single speck of dust in the darkroom, it will be found on the negative being printed." While this sort of problem is tolerable in black-and-white printing, where spotting involves only a 00-size sable brush and a bottle of SpOTone, it can become a nightmare in color printing, where spotting may often involve a half-dozen different dyes, several brushes, and cotton balls galore. This is where the diffusion-type enlarger has a big advantage over the condenser type. Diffusers tend to minimize all of the problems that condensers often exaggerate.

Most contemporary condenser enlargers provide a drawer, usually located between the condensers, or between the lamp and the condensers, that will accept the various filters (I'll get to them shortly) required for color printing. Very old condenser enlargers do not have such filter drawers, though some of them do have provisions for swinging filters below the lens. Such machines are only marginally suitable for color printing work, unless through modification it is possible to add a filter drawer above the negative stage.

Diffusion enlargers

The diffusion enlarger is an inefficient machine that is very well suited to the requirements of color printing. These enlargers make only poor use of their lamp's light output, but this low-efficiency lamp utilization is quite intentional on the part of the designers. Diffusion enlargers, designed specifically for color printing, employ light-mixing chambers between their lamp/filter compartment and the negative stage. These chambers are so designed as to insure that all of the portions of the enlarger lamp's output that have been modified through filtration (usually dichroic—I'll explain that term shortly, under filters, too) are thoroughly "mixed" on their way from the filter section to the negative stage. Some diffusion enlargers employ mirror chambers to do this mixing, while others rely on rough-surfaced, white plastic panels to do the job. At the bottom of the mixing chamber, just above the negative stage, such enlargers universally employ a diffusion plate that

takes the already thoroughly-non-directional light and scatters it still farther, insuring that whatever illumination does finally fall on the material loaded in the negative stage will be highly diffused (coming from all directions at once). Some diffusion plates also perform as built-in ultraviolet (UV) filters.

While this kind of arrangement provides for the least efficient utilization possible of the lamp's output, it also provides a type of illumination that goes a very long way toward suppressing the imaging of all the dust, dirt, water marks, blemishes, scratches, and other horrors that are often found on even the most pampered negatives and slides.

If all of these little uglies fail to leave an image on the print, it follows that you won't have to go through the often tedious process of spotting your color prints. Anything that reduces this requirement is desirable, and if this reduction has to be brought about through the inefficient use of the enlarger lamp, well . . . so be it. But in this world you seldom get something for nothing, so you will note that many diffusion enlargers have had to go to the extreme of using high-powered (typically 150 to 300 watts) tungsten-halogen (typical color temperature of 3200 K) bulbs and vibration-prone, fan-forced cooling systems. Those diffusion enlargers that rely on convection/conduction/radiation cooling and lower-wattage bulbs often have considerably reduced printing speeds.

I should mention that the reason this highly diffused light is able to get through color negatives or color transparencies with relative ease is that these color images have no silver in them at all, just transparent dyes. Diffusion enlargers can be used to print black-and-white material, but it is necessary to develop black-and-white negatives somewhat longer than is thought of as normal, so as to increase their contrast or, alternatively, to use standard negative development but print on a harder grade of paper than would be called for by a condenser enlarger, so as to get the proper printing contrast.

It is helpful, when using a diffusion enlarger with the capability of printing rather large negatives (say 4x5 inches, for example) to print small-format negatives (typically 35-mm), to use special light-concentrating mixing chambers, designed to provide the most efficient utilization of the enlarger lamp's output under the circumstances.

COLOR PRINTER'S BIBLE

Otherwise, these large-format machines often provide prohibitively slow printing speeds when used to do small-format work.

Condenser/diffuser conversions

Perhaps the cheapest way to convert a condenser-type enlarger to a diffusion-type is to remove one or both of the condensers and add a diffusion sheet just above the negative stage. While this is an inexpensive and simple way to get from a focused to a diffused light source, it is also a method that will cut the enlarger's printing speed way down.

A considerably more expensive alternative is to purchase a conversion head for your enlarger. These devices are often offered by the firm that built the machine, and they are also widely available from several independent sources. All the condenser/diffuser conversion heads I am familiar with provide a set of dichroic filters as a built-in feature. They allow you simply to turn one or two knobs to dial in the amount of filtration desired, rather than having to open a filter drawer manually and remove and/or insert filters to make a change. These conversion heads also have their own source of illumination, always a tungsten-halogen bulb in my experience, of sufficient wattage so that little, if any, printing speed is lost by making the change from condenser illumination.

Filters: what they do

Do you remember, many words back, how I explained that the dyes in a color negative or a color slide, when placed in the enlarger's negative carrier, would absorb portions of the enlarger lamp's white-light output? I lied. The light output of an enlarger lamp is anything but "white." Most enlarger lamps have a color temperature of about 3000 K when they are new.

After they have burned for a while, their color temperature is anyone's guess. The international standard for "white" light is 6504 K. See what I mean? In addition to the lamp's not being "white," each box of printing paper has its very own peculiarities. The paper's emulsion layer's response to the additive primaries will most often vary widely from layer to layer and from emulsion batch to emulsion batch. There are other glitches as well, but these two will do for illustrative purposes here. To bring the light reaching the color printing

paper to a proper color balance, it is most often necessary to alter the properties of the light coming from the enlarger lamp with color printing (CP) filters. These filters are used to absorb or reflect some of the unwanted components of the visible portion of the spectrum.

Acetate color printing. Acetate CP filters are made from thin sheets of acetate plastic containing dyes of several colors and densities. They are the type most widely used by color printers. This is not because they have any magical properties, but simply because they are the cheapest and most convenient type of filters available for what is probably the majority of color printers. The reason, I suppose, that the majority of color printers use them is as simple as the fact that I believe that the majority of color printers are using the type of enlarger that features a filter drawer somewhere in the light path between the enlarger lamp and the negative stage. Acetate CP filters are fine for use in situations such as this, but, because of their rather poor optical properties, they should not be used under the lens. That location calls for CC filters. I'll get to them shortly.

When used in a filter drawer above the image-forming light path, acetate CP filters perform their color-temperature-modification task by absorbing specific portions of the

spectrum. The most common types of CP filters are those in the colors cyan, magenta, and yellow. However, red CP filters are also available. The CP filters in the subtractive primary colors are used to absorb their complementary from the enlarger lamp's output—cyan absorbs red, magenta absorbs green, yellow absorbs blue—while the red filters (red being an additive primary) are used to absorb both other additive primaries (blue and green) simultaneously. CP filters are available in several different dye densities (deepness of color) ranging from .025 to .40 (.80 in yellow) from Kodak, and in several other density values from various other sources. Those density values may be a bit hard to appreciate all by themselves, so it may help to explain them in terms of the amount of light the filters will absorb. A .05 density filter in any of the three subtractive primaries will absorb about 20 percent of the light in (the spectral peak of) its complementary color, while a .40 density filter in any of the subtractive primaries will absorb about 70 percent of the light in (the spectral peak of) its complementary color. These same absorption figures apply approximately for the red CP filters as well. Of course, in the case of this additive primary color, it is the two other additive primaries that are being absorbed rather than the complementary color. Just to confuse matters a bit, there is another type of CP



These printing calculators are contact printed to determine the correct printing filter pack and exposure for a given negative. The units shown are designed for use with negative-to-positive printing only. Positive-to-positive calculators are also available at your dealer.

"When used in a filter drawer above the image-forming light path, acetate CP filters perform their color-temperature-modification task by absorbing specific portions of the spectrum."

filter, which Kodak recommends for printing color negatives, called cyan-2. The cyan-2 filters are designed to absorb more of the far-red and infrared than the standard cyan filters. The cyan-2 filters in a .05 density have a peak absorption of about 30 percent. The cyan-2 filters of .40 density absorb about 80 percent of their peak complementary.

Now that you have some idea of what's available, what function each of the CPs performs, and how much capacity each of them has, it might be useful if I let you know how many of them you will need for normal color printing requirements. I suggest a set consisting of the following densities in cyan (or cyan-2), magenta, and yellow: one each—.05, .10, .20, and .40. In addition, you will also need one more .40 magenta filter and one additional .80 yellow filter.

If your enlarger has an odd-sized filter drawer, and your enlarger's manufacturer doesn't make a set of color printing filters specifically for it, you can purchase larger sized acetate filters and simply trim them to the required dimensions with a razor blade or scissors.

The densities of acetate CP filters are additive, that is, if you need to make a filtration change of .55 density in yellow, you can make the change by adding a .40 yellow, a .10 yellow, and a .05 yellow filter together, to get the .55 density required.

Ultraviolet and infrared. There is another acetate filter, called a CP2B, used when printing color negatives or color slides on Cibachrome, to cut off radiation beyond about 390 nanometers, at the ultraviolet end of the spectrum.

This filter can simply be left in the enlarger's filter drawer at all times (it won't hurt your black-and-white prints and, as a matter of fact, it may help them a bit), unless you are printing color slides on Kodak materials, when it should be replaced with a 2E filter. The 2E also cuts off the ultraviolet end of the spectrum, but it is designed to cut off everything below about 415 nanometers. Unfortunately, the 2E filter is only made (by Kodak) in gelatin and is not available in sizes larger than 5 inches square at this writing. For all practical purposes, a CP2B will do in place of a 2E. The 2E can also be left in place when printing black-and-white, if it is convenient to do so.

The ultraviolet end of the spectrum is not the only one that has to be lopped off if you expect to get first-quality color prints. You will have to amputate the infrared end (beyond 700 nanometers), as well. The cheapest way to accomplish this is to add a heat-absorbing glass (HAG) to your filter drawer. HAGs are usually available through the manufacturer of your enlarger in a size appropriate to the model you own; however, they are also available from independent suppliers. It is a good idea to leave a HAG in the enlarger at all times. They can't be anything but beneficial. In addition to the HAG, Kodak recommends a 310A (the successor to the 301) dichroic, infrared cutoff filter for use in printing certain types of transparencies directly onto their type 1993 paper. This filter is very expensive and its size availability is rather limited. Here again, for most practical purposes, the 301A can be substituted for by a HAG without any overly serious consequences. If, however, you do purchase this filter, be sure that you find some place in the light path to put it where it will be parallel to the negative stage. Dichroic filters, such as this one, work improperly when they are not correctly oriented.

Dichroic. Dichroic filters consist of a microscopically thin film of material that has been vapor deposited on a glass substrate. They are quite different from the acetate CP filters I have been discussing. The acetate filters work by absorbing the unwanted portion of the spectrum. Dichroics work by reflecting the part of the spectrum you don't want to hit the printing paper. With acetate filters, it is necessary to have a number of filters in each of the subtractive primary colors, so that pack changes can be made by substituting filters of

different densities. Only one dichroic filter, in each of the subtractive primary colors, is required. In order to vary the amount of filtration achieved, one simply puts more of the dichroic filter into the enlarger lamp's light path.

Let's say that a magenta dichroic filter 1x1 inch in size is placed so that its entire 1-square-inch area is completely illuminated by the enlarger lamp. So placed, it will reflect as much green light as a 1.50 magenta acetate CP filter will absorb. It shouldn't be too hard to decide to call that setting of the dichroic filter 1.50 M. Now, if I begin to retract the dichroic filter (remove it from the enlarger lamp's light path) until I am able to determine that the amount of dichroic filter remaining in the light path is reflecting an amount of green light equal to the amount that two .40 magenta acetate CPs will absorb, I can mark that position as .80M.

This is exactly how dichroic filters are used. They are mechanically moved into and out of the light path in accordance with the amount of control dial movement the operator elects to use. The control dials of most dichroic enlarger heads are usually calibrated in very fine increments, many as fine as .01 density, so that very precise filtration changes can be very conveniently achieved. The control dials, accessible at the front of the enlarger, are, of course, mechanically linked to precise non-linear cams that are used to position the dichroic filters in the light path.

While it is possible to use dichroic filters exactly the same way that acetate filters are—by stacking them in several specific density values to obtain the amount of reflection required—this is never done, for several reasons. The primary one is that dichroic filters are very expensive. Size and fragility are others. The glass substrate of a dichroic filter is many times thicker than a typical acetate filter, and it must be so for mechanical reasons. You would have to have an awfully large filter drawer to accommodate more than a few dichroic filters in a stack. It is easy to damage the thin coating of dichroic filters, and they break when they are dropped.

Obviously then, you can't run out to your neighborhood camera store and buy a set of dichroic filters. Even if you could, you would need to have a rather large machine shop at your disposal to modify your enlarger, to put them to work. The only practical way to obtain dichroic filters is to buy a set that is already incorporated in an enlarger, or

COLOR PRINTER'S BIBLE

an enlarger conversion head that is optically and mechanically designed to use them. Such enlargers (or conversions) provide a special tungsten halogen lamp, plus all of the mechanical linkage needed, in addition to the filters themselves. And they incorporate light-integrating (mixing) chambers to insure that the light, which has been modified by portions of one or two dichroic filters, is thoroughly mixed with the unmodified white light that has bypassed them. This thorough mixing is absolutely essential to proper dichroic filtration enlarger operation.

(The 301A dichroic infrared cutoff filter is an example of a partial exception to my statements above. But while it is available for use much like an acetate CP filter, there are damn few printers who can afford one, or who are willing to spend the amount of money for one.)

At this time, the typical maximum dichroic filter density directly dialable on an enlarger is 1.60. This density will, in some rare cases, be insufficient for color printing needs. However, there is no reason why acetate filters can't be combined with dichroics, when and if you run out of dichroic filtration. Of course, to be able to combine these two types of filters, the enlarger head itself will have to be able to accommodate both types. There are several that will and several that won't. It is something to consider when shopping for an enlarger with built-in dichroic filtration.

Gelatin color-correcting. It is *possible* to do single-exposure, subtractive color printing using an enlarger that, because of its ancient design, must have its color printing filters located under the lens; however, it is not a very *probable* sort of activity.

Gelatin filters are manufactured in both the additive and the subtractive primary colors, in a wide range of densities. You can use gelatin color correcting (CC) filters anywhere in the image-forming path, but doing so involves a good deal of ingenuity, a good stock of CC filters, and very clean fingers. Unlike the users of acetate filters, who can be rather sloppy about the cleanliness of their CP filters, since they are placed above the image-forming light path, the user of CC filters must be a *fanatic about filter cleanliness* and keep his filters scrupulously free of scratches. Any dirt, dust, or optical imperfections in the image-forming light path will degrade the

image being printed. The below-the-lens, CC filter user must also be quite sure that all of his filters are parallel to one another and that they are all perpendicular to the optical axis of the lens, or he may also end up with degraded images. As a matter of fact, it's advisable to keep the number of below-the-lens filters down to an absolute minimum to reduce optical problems to manageable proportions.

Using CC filters below the lens does not eliminate the need for both IR and UV cutoff filters. If these can't be accommodated somewhere above the lens, they will have to be located below it, increasing the number of surfaces the image-forming light path must cross and increasing the probability of producing degraded images. Both the 2B and 2E UV cutoff filters are supplied in gelatin.

The HAG and 301A filters are glass. One possible way to accommodate them is simply to place either or both (when printing on Kodak's type 1993 paper) right on the rear flange of the enlarging lens. This assumes, of course, that the enlarging lens you are using has a rear flange, and, if it does, that the rear element doesn't protrude out beyond it.

Miscellaneous hardware items

Safelights. The negative-to-positive color printer has two choices of safelight filter—both of them from Kodak—the No. 10 and the No. 13. Both are a dark amber color. The No. 10 gives off so little light with a 15-watt bulb behind it that it is essentially useless. The No. 13 filter will allow a bit of illumination and may be considered as a luxury item, for use when printing color negatives. Essentially, though, I would suggest that you put a color printing safelight at the very end of your list of items needed to fit out your color darkroom. If you decide to process color prints in a rational manner—that is, in daylight print processing drums—you will have virtually no need for a safelight at all, because the only time you will have to turn out the darkroom's white light will be for the few seconds during which you make your printing exposure and then, subsequently, load the exposed sheet of paper into the drum. However, if you opt for an outmoded processing technique, such as working with the Kodak model 11 or model 16 processors or (perish the thought) trays, you will have a definite need for the eerie illumination provided by one of these two Kodak safelight filters.

The materials used for making color prints directly from transparencies are

even fussier about their safelight requirements. Kodak's Ektachrome RC, type 1993 paper must be worked in total darkness. Ciba's several direct-positive materials can be worked under an Ilford GB-908D filter (over a 15-watt bulb), but it is hardly worth the effort for the illumination you will get out of it.

If you do decide to use a safelight of any kind in your color darkroom, be sure that it is at least 4 feet from the surface of your sensitized materials. Or, better yet, bounce it off the ceiling or walls.

Easels. There is only one thing you need to know about enlarger easels and that is that the only easel color suitable for use with color materials is black—matte-black. If you already own an easel and it is yellow, white, or gray, paint it matte-black. If you think I'm nuts, try putting a few strips of black tape on the surface of your other-than-black easel and then use it to make a few color prints. Don't be surprised to find the tape pattern clearly reproduced on the print. A yellow easel surface bounces red and green light right back up through the paper, re-exposing it from the bottom up. A white easel re-exposes all three emulsion layers, and a gray easel acts like a white one, but to a lesser degree.

If you can't find a matte-black easel, buy a can of matte-black paint and alter it yourself. (In case I seem to be overly emphatic about this, it is because I learned about it the hard way, by ruining a number of exhibition, mural-size prints making them on a yellow easel—a lesson I will not easily forget.)

Timers. These serve two principal purposes. On the dry side of the darkroom, they monitor or control the time during which the enlarger lamp burns during print exposure, and on the wet side they monitor or control the amount of time elapsed during any of the numerous processing steps. Some darkroom timers resemble clocks. Others look like leftover props from a Buck Rogers movie. Still others don't look like much of anything at all, as they aren't meant to be observed. These devices keep track of time audibly, by clicking like a metronome, or by talking to you from the loud speaker of a tape player. I have some very strong feelings about darkroom timers, which I will make known here. Essentially, I feel that 99 percent of them don't belong in a darkroom.

Some timers are nothing more than timekeeping devices. They perform no

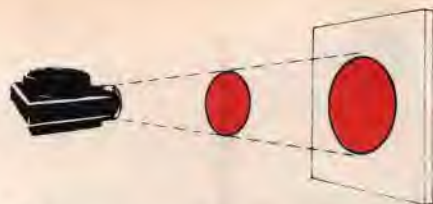


Fig. 1
A red filter lets only the red component of white light through.

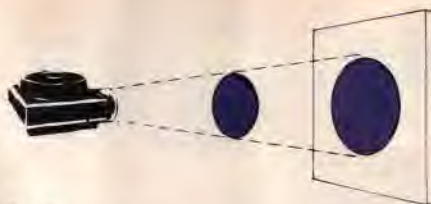


Fig. 2
A blue filter lets only the blue component of white light through.

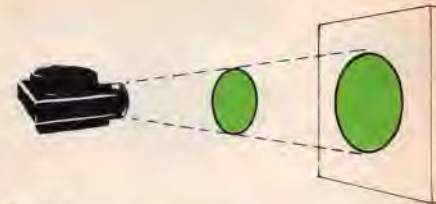


Fig. 3
A green filter lets only the green component of white light through.

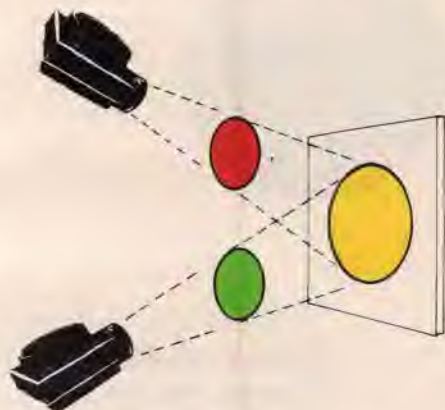


Fig. 4
If you blend equal parts of red and green light, the resulting color seen will be yellow, blue's complementary (exact opposite) color.

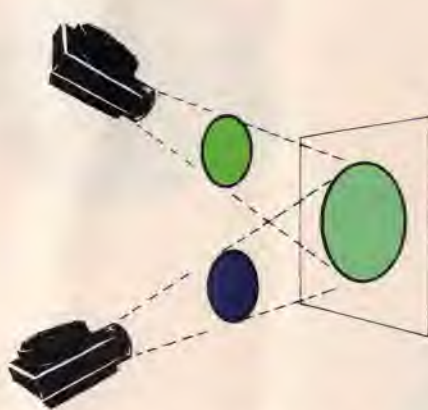


Fig. 5
Similarly, a mixture of green and blue light yields red's complementary, cyan.

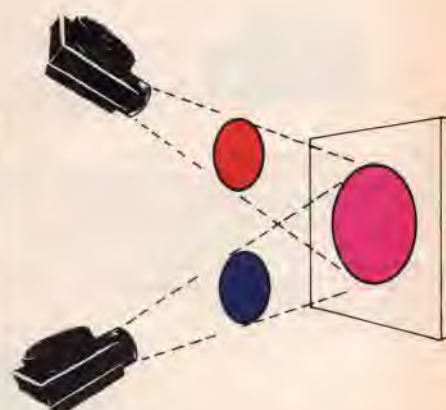


Fig. 6
Magenta, green's complementary, results from a mixture of blue and red light.

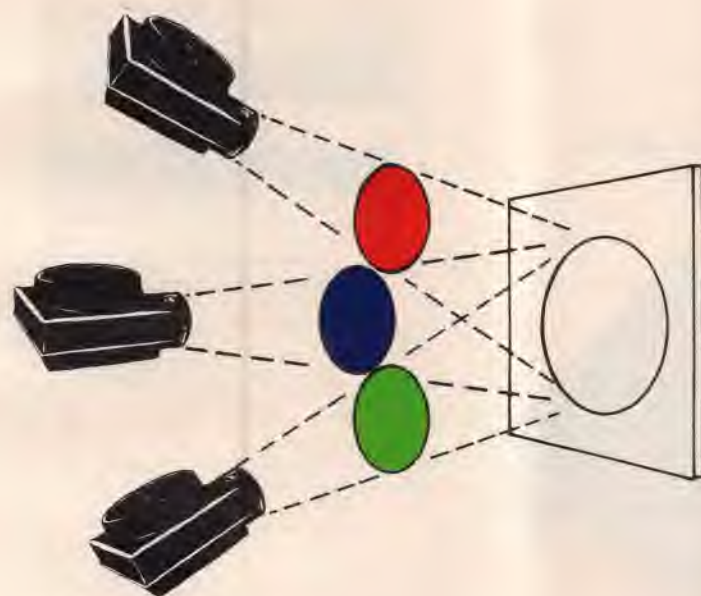


Fig. 7
White light is a mixture of equal parts of red, green, and blue light.

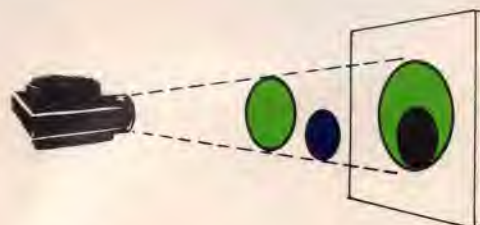
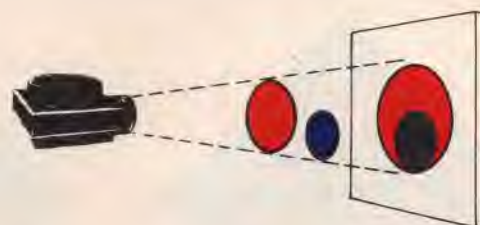
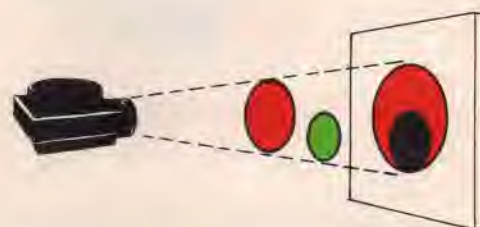


Fig. 8
Any two additive primary filters placed over a single source of light will pass no light.



Fig. 9
Cyan subtracts red, but passes green and blue.



Fig. 10
Magenta subtracts green, but passes red and blue.



Fig. 11
Yellow subtracts blue, but passes red and green.

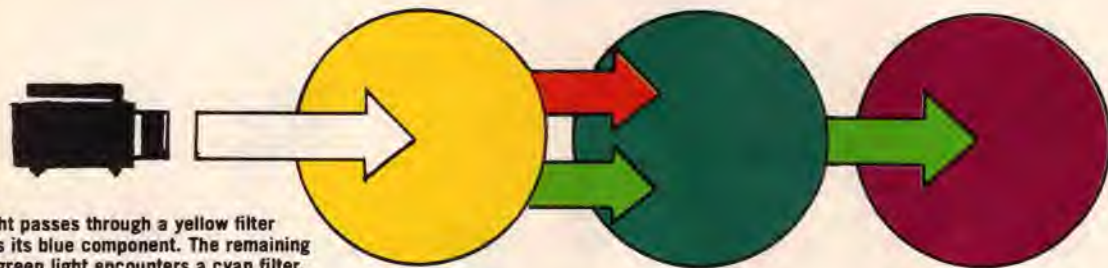


Fig. 12
White light passes through a yellow filter and loses its blue component. The remaining red and green light encounters a cyan filter, where the red component is absorbed. This leaves only the green component of the original beam of white light to pass through to the magenta filter, where it too is absorbed. The result is neutral density.

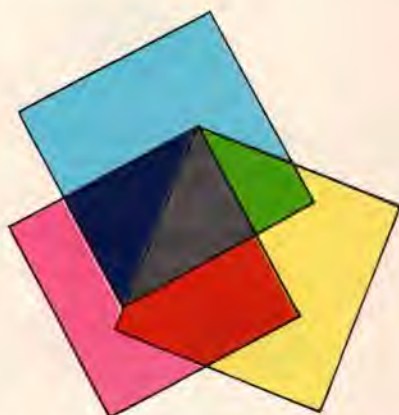


Fig. 13
By overlapping the filters of three subtractive primary colors, the additive primaries are formed wherever any two filters are superimposed. However, where three filters are stacked one on top of the other, neutral density (gray) is formed.



Fig. 14
Low-density subtractive primary filters remove only a portion of white light's three component colors and form low neutral density (gray).



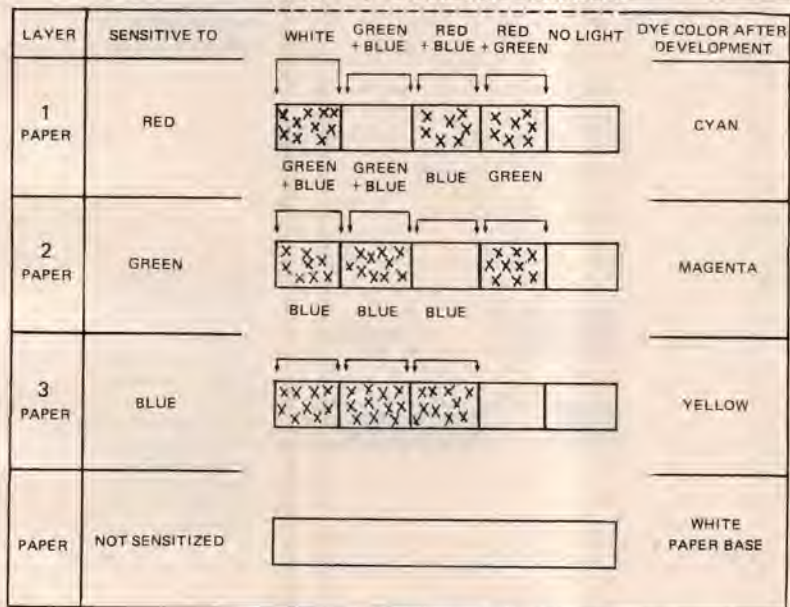
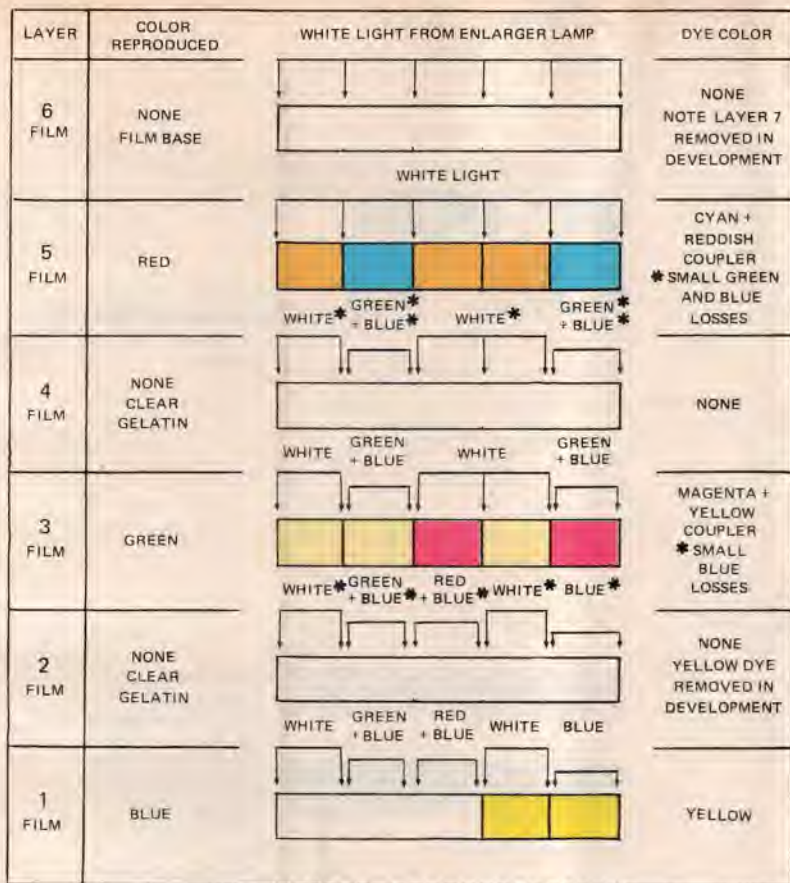
Fig. 15
High-density subtractive filters remove all of white light's three component colors for high neutral density (black).

TYPICAL CIBACHROME DYE-BLEACH PRINTING PAPER CONSTRUCTION

S	ANTI ABRASION LAYER
SH-Y	SHINY YELLOW
YD	YELLOW DYE
YF	YELLOW FILTER
SH-M	SHINY MAGENTA
MD	MAGENTA DYE
G	GREEN
CD	CYAN DYE
SH-C	SHINY CYAN
B	WHITE OPAQUE PLASTIC BASE

Fig. 16

PRINTING A COLOR NEGATIVE Fig. 19



PAPER DYE LAYERS AFTER DEVELOPMENT

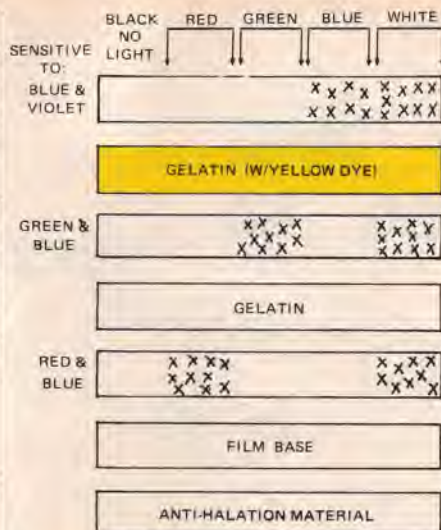


LOOKING DOWN AT PAPER AFTER DEVELOPMENT

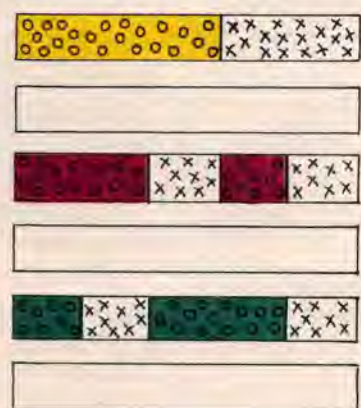
SECTION



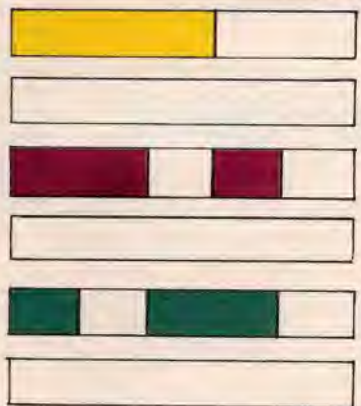
FORMATION OF A COLOR-POSITIVE SLIDE IMAGE Fig. 20



Initial exposure of color transparency film, in camera, and subsequent development in black-and-white developer (xxx=metallic silver formed in b&w developer).



Film after re-exposure (or chemical fogging) and subsequent development in color developer. (ooo=metallic silver formed in color developer).

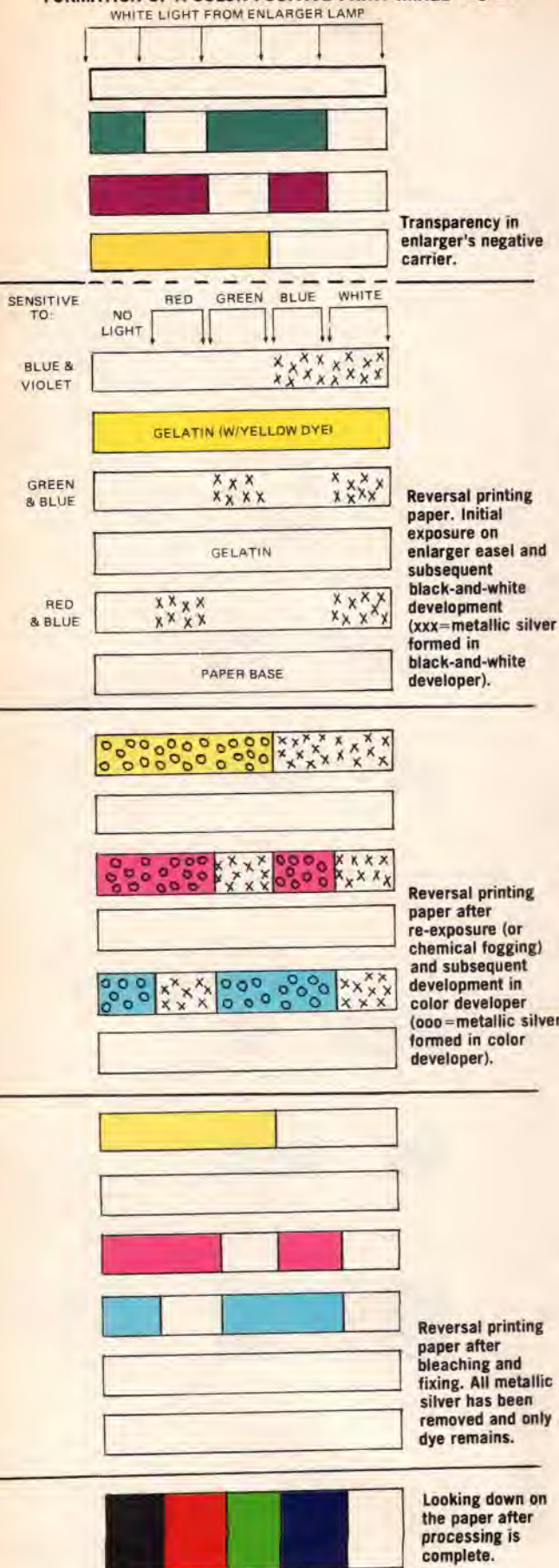


Film after bleaching and fixing. All metallic silver has been removed and only dye remains.

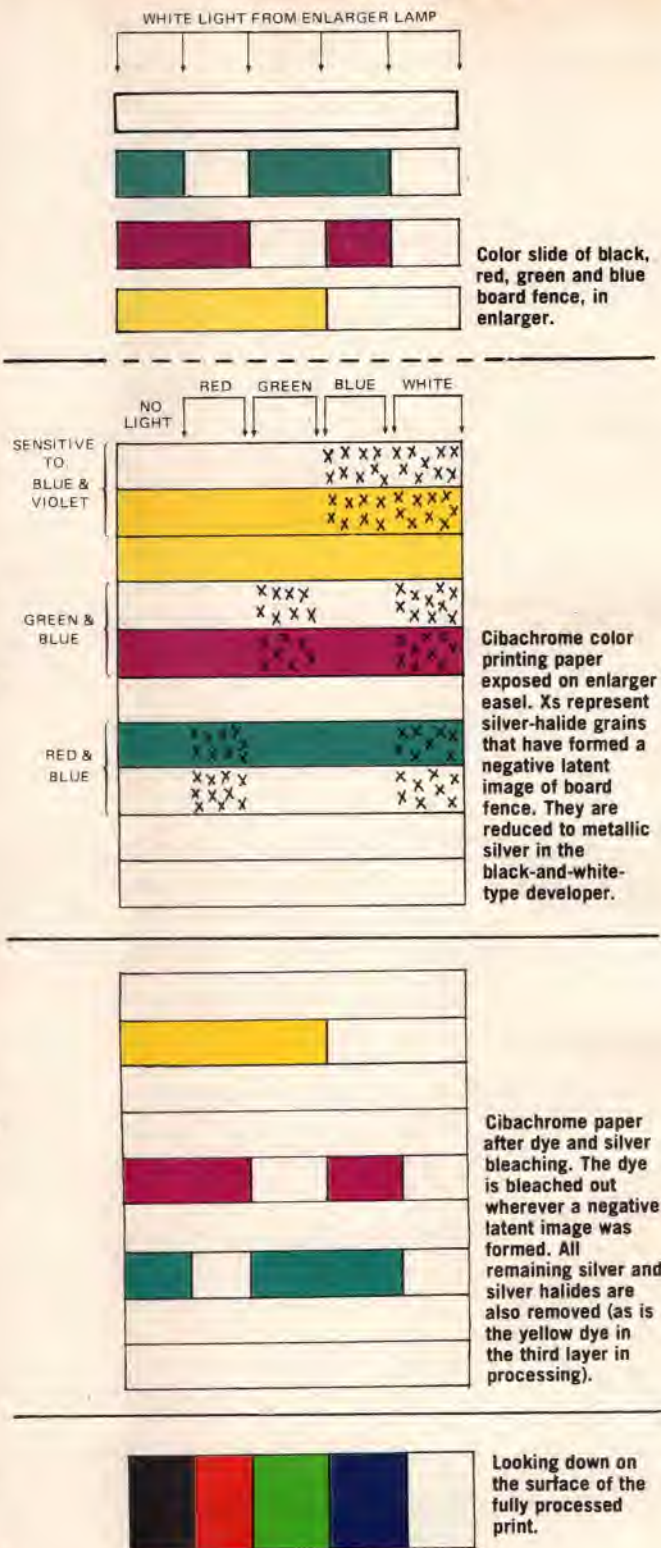


Looking down at white light shining through the film after processing is complete.

FORMATION OF A COLOR-POSITIVE PRINT IMAGE Fig. 21



FORMATION OF A COLOR-POSITIVE IMAGE ON CIBACHROME DYE-BLEACH PRINTING MATERIAL Fig. 22



electrical switching functions at all. This type of device is usually spring powered and it is usually, but not always, cheaper than the switching-type timer. If you can afford to purchase an electrically powered timer capable of performing electrical switching, it will save you a good deal of trouble.

Most switching timers allow you to turn the enlarger lamp manually on and off, or to select an automatic mode of operation that turns the enlarger lamp on at the beginning of the timer-controlled print exposure, and off at the end of the preset length of exposure time. Such timers provide an outlet into which your enlarger's line cord may be plugged. Many such timers also provide a second receptacle into which a safelight may be plugged. The timer's switch is so arranged that the safelight will go out when the printing exposure is started and back on again at the end of the exposure. This isn't much of a consideration in color printing, but it can be useful in black-and-white work, where the level of safelight illumination is very much higher.

Some control timers provide for operation by foot pedal as well as their normal hand-operated mode. This feature can be useful for burning and dodging operations.

Control timers with sufficiently long controlled time periods are also very useful in processing color prints. Print processing drum agitators can be plugged directly into their enlarger outlets and will run for the predetermined length of time set on the timer. At the end of this period, some timers will sound an alarm. This feature allows you to do other things while your print is being processed.

There seems to be a good deal of confusion among printers about just what kind of timer is suitable for color printing use. I have seen an incredible array of extremely sophisticated, remarkably accurate timing devices being touted for color printing application. My students are often amazed to find that they are expected to work with timing devices that won't split the second into tenths. I can think of nothing more useless than the ability to set my timer for 47.3 seconds.

Consider, if you will, that most amateur, and many professional, enlargers provide a level of illumination that when focused on an easel through an f/4 or f/5.6 lens opening, will produce a color print of average size (say between 3x and 6x) in the neighborhood of between 10 and 30

seconds. Even if you have an enlarger that is appreciably faster, the chances are that you will stop down your lens to increase the exposure time to allow you to do a bit of dodging or burning in. If your minimum exposure time is 10 seconds, then a 1-second change in exposure will provide a 10 percent exposure time difference. A 10 percent exposure change is a very small one indeed. As a matter of fact, it is so small that the thought of bothering with anything much smaller seems to me to be pretty much a waste of time and effort. But supposing you decide that you really have to make a 5 percent exposure time change, for God knows what reason. If you have a timer, calibrated in 1-second increments, of an electromechanical (clock movement) type, you will be able to set the timer to a spot between the 10- and the 11-second marks to get your barely perceptible 5 percent change. (I would like to meet the printer who can distinguish between two prints exposed and processed identically in all respects except one, that one being that one print got 10 seconds of exposure while the second got 10.1 seconds. No way!) And, of course, this splitting of seconds into minute parts becomes even more ridiculous when it is done for longer exposures. The exposure difference between a print exposed for 30.3 seconds and one exposed for 30 seconds is 1 percent. It is undetectable.

The properties I have found to be absolutely essential in a darkroom timer are: the ability to count time down (as it is in a rocket launch) and be easily readable in the dark while so doing; repeatability, if not accuracy; good visibility in the dark; that it be easily set in 1-second increments; that a switch be provided that will allow you to shut the enlarger lamp off during the automatically timed period. My own secondary considerations include the timer's ability to: make a series of exposures of identical duration with no need for resetting; function over a rather long (about 1 hour) time span; sound an audible alarm at the end of a preset time span.

Solid state timers are anathema to me because they don't tell me how much time I have remaining to do what I want to do. The ones with big enough digital displays to show how much time has elapsed are very expensive and, I suspect, will fog paper under the right circumstances. Actually, the luminous dials of all darkroom clocks will fog printing paper, if you bring it very close

to them.

Both metronomes and cassette tape instructions are simply beyond my ability to cope with. I can tolerate and sometimes even enjoy, music in the darkroom. No other audible inputs need apply.

Constant-voltage transformers. The stuff your power company sells you is anything but constant in quantity. Sometimes the juice you get from your wall outlet is at 97.3 volts and at other times it's 117.4 volts. The most awful thing about the nature of the electrical energy you purchase is the unpredictability of just what voltage will be delivered at the moment you decide to make your printing exposure. If you make a print you like while your line voltage is at 110 volts, and then make an exact duplicate—but this time with only 105 volts across the enlarger lamp's filament—you will find that the second print is of a considerably different color from the first, perhaps off by as much as .10 blue. The lower the line voltage, the lower your enlarger lamp's color temperature.

There are several ways you can fight this problem. You can stay away from the darkroom except during the hours of 1 to 4 a.m.; you can buy your own power-generating equipment; you can buy a variable transformer and a voltmeter and keep a small boy around to monitor the line and correct the voltage manually; or you can buy a constant-voltage transformer (or solid state device).

My first alternative solution has some obvious drawbacks, and even if you do work only in the wee small hours, you may still find that there is a factory on your power-distribution line that starts throwing heavy loads on and off the line about the same time you begin to work. It's tough to beat line-voltage variation by regulating your working hours. And I seriously doubt that many color printers will be in a situation in which owning and operating their own power supply systems will make much sense. So it seems as though there are two real choices, both involving one kind of a transformer or another.

The cheapest of the transformer routes is the manually adjustable variable transformer. These devices, available from any electrical or electronic supply house, will, with the twist of a knob, bring your voltage either up or down, compared to what is coming out of your wall outlet, but you won't know by how much unless you also buy

COLOR PRINTER'S BIBLE

a voltmeter and hook it across the output line. Now all you have to do is keep your eye on the voltmeter to make sure that you have the voltage level you want just before you push your timer's start button. The big problem with this solution is that it is a pain in the neck to implement. Chances are that you will remember to check your line voltage for the first exposure and forget to do so thereafter. If the power company's product comes in at a different voltage between your first and third exposures, and you don't notice it, you will have a couple of off-color prints.

Then there is the problem of line transients. A line transient, for our purposes here, is a very short time variation of line voltage caused by the surge of power required to start heavy motors, etc. If you live in an old and inadequately wired building, you can see these transients occur as your lights dim when the building's elevator starts up, or when a heavy appliance such as a powerful vacuum cleaner or a washing machine starts up. These short-duration line voltage transients may not affect you too badly if you are making long exposures, but they can play hell with short ones. A variable transformer won't take these little spikes out of your line voltage.

Having exhausted all of my cheap alternatives, I have finally reached the one that provides the best, if the most expensive, solution: the constant-voltage transformer (CVT). A CVT will automatically keep the voltage across your enlarger lamp's filament at a constant level, plus or minus about 1 percent, for an input line variation of about ± 10 to 15 percent, depending on the unit. It will also go a long way toward ironing out line transients. The problems with CVTs are that they cost a lot of money, emit a mind-blowing 60-cycle hum, are of not inconsiderable size, and weigh like lead. In spite of all their problems, they are an excellent investment for the serious color printer.

There are several constant-voltage devices on the market that do not use the massive iron core of a CVT for regulation, but instead substitute some clever solid state circuitry. These units are small, quiet, and light, but I don't recommend them. Their output is usually chopped d.c. as opposed to a true a.c. waveform. This makes such devices inappropriate for use with anything but a resistive load. If you use them to drive an incandescent enlarger lamp directly,

they will work, but if there is a transformer between the solid state regulator and the lamp, forget it; you may damage your transformer. That means you had better not try to hook up any enlarger that uses a low-voltage, tungsten-halogen bulb to such a device. Another nasty problem with these solid state devices is that, in all of the units I have seen, the designers chose to solve some of their problems by providing a rather low output voltage. While they do manage, through clever circuitry, to hold that output voltage rather constant, I have found that most enlargers using normal incandescent-type bulbs lose about a full stop of printing speed when connected to these devices.

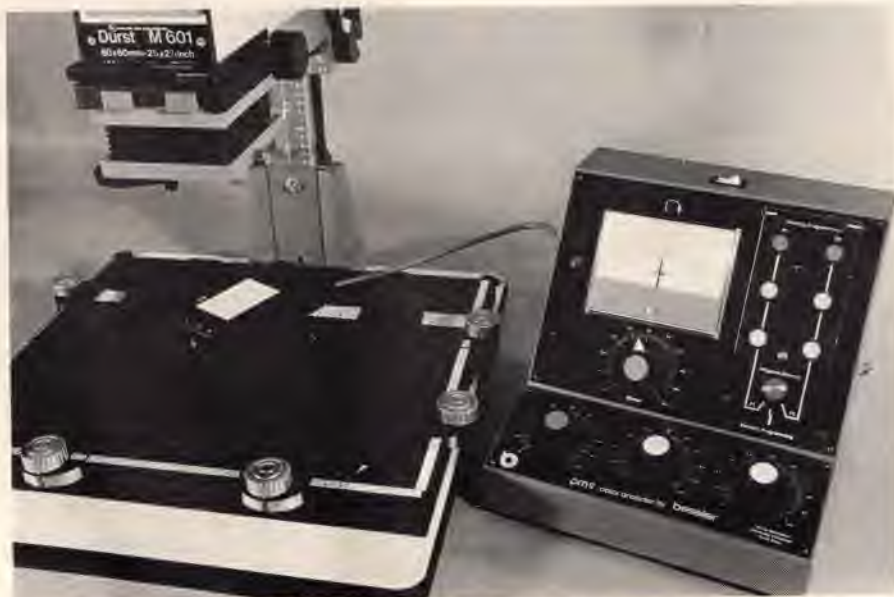
One interesting recent development along these lines is that at least one manufacturer I am aware of is offering a CVT built into his color enlarger's power supply. This kind of design is a natural with any color enlarger that uses a low-voltage, tungsten-halogen bulb, as the CVT can be economically designed right into the power transformer required for the enlarger lamp. If such an option is available for enlarging equipment you may be considering, I would suggest it to you strongly.

One final note on CVTs: if you purchase a unit rated for an output wattage considerably higher than the load you intend to put across it, in most cases you will find that its regulation will not be quite as tight as it will with a load equal to its rated capacity. Typically, a 400-watt CVT will deliver about ± 1

percent regulation to a 400-watt load, but will provide only about ± 2 percent regulation to a 75-watt load. Your best bet then will be to use a CVT of a rated output not appreciably higher than your enlarger's lamp load.

Focusing aids. Focusing aids are devices that are designed to help you bring your composed image to sharp focus on the enlarging easel. They are a virtual necessity in color printing, because it is usually considerably harder to focus a color image than it is to get a black-and-white one sharp. By the time you get all the filtration you need into the enlarger lamp's light path, and then pass what is left of that light through the dyes of the image itself, there isn't that much left to focus by. It is for this reason that very fast enlarging lenses are a boon to color printing. Even if they are never used wide open to print, they can certainly be used for composition and for initial focusing at their widest stop. Of course, the focus should be rechecked when the enlarging lens is stopped down to its exposing opening, but with a quality lens there should be very little or no focus shift from wide open down to the middle aperture settings.

To my way of thinking and seeing, there is only one type of focusing aid even worth mentioning, and that is the grain focuser. However, for some reason I can't fathom, there are people who just can't use grain-focusing devices. As a matter of fact, I have known several printers who let out terrific yelps the first



Electronic analyzers like this are capable of determining the correct printing filter pack and exposure by checking the color balance of light projected through a negative or slide against what you have determined that light should look like. The machine's results can only be as good as the data you have stored in it. This Beseler machine will store three separate programs internally.

"Solid state timers are anathema to me because they don't tell me how much time I have remaining to do what I want to do."

time they put their eye to the eyepiece of a grain focuser, and then backed away from the device clutching their eye and uttering vile curses. As a concession to such weaklings, I will mention screen- and parallax-type focusing devices here—but only after I tell you how wonderful grain focusers are.

A grain focuser incorporates a mirror, at a fixed angle and a precisely regulated distance from the surface upon which you are focusing, to reflect a tiny portion of the image being focused up into a tube containing a reticle and an eyepiece. The eyepiece, most often, provides an image magnification of between 10x and 20x. If you are looking through a 15x eyepiece at an image being projected at 8x, you see the image at an effective 90x magnification. The reticle is provided to give your eye something to focus on as grain focusers provide an aerial image at the plane of the reticle. With your eye focused on a 90x magnification of the image, it is quite easy to see the individual silver grains, which comprise a black-and-white image. But there are no silver grains in a color image, right? Not to worry! When you look at a color image through a grain focuser, you can see the places where the silver grains used to be. (I know that sounds silly, but effectively it is true because of the way that the dyes form in the immediate vicinity of metallic silver particles and coupler globules.) The biggest problem most grain focusers suffer, because of their optical design, is that they can't be used very far away from the center of the projected image. Because of this, it is impossible to check the corners and edges of the projected image for critical focus. There is only one grain-focusing device I know of at present that has been able to overcome

this problem. It is Chromega's Micromega. The solution is expensive, however.

Screen-focusing devices operate very much the same way that grain focusers do except for two characteristics: their aerial images are focused on a groundglass screen and their eyepiece magnifications are considerably lower than the grain focusers'. It is impossible to use a screen-focusing device to focus on the grain (or where the grain used to be), because the texture of the focusing screen itself obscures the grain. These devices are best used on an area of the image that contains a great deal of fine, high-contrast detail, such as printed material, ruled lines, etc. People who clutch their eyes in horror after trying to use a grain focuser seem to prefer this type of unit. One of the most unusual of the screen-focusing devices I have come across is the Unicolor-Mitchell Focusing Aid. Because of its very peculiar design, it is sort of a poor man's Micromega. It can be used to get the most remote corner of an image into focus, if that corner provides sufficient image detail to focus on. Used with a specially prepared black-and-white negative, it can help in aligning an enlarger. And because this unit is physically quite long, it makes focusing mural-size, wall- or floor-projected, images less of a hassle.

There is one inexpensive focusing aid, which I must admit I use constantly—in preference to several others of considerably higher quality (and price) that I own—that combines the properties of both a grain-focusing and a screen-focusing device. It is the Rondo Dual-Image Focus Scope. This unit incorporates a thin groundglass screen with a hole cut out of its center. The image can be brought into coarse focus on the screen, quite easily and quickly, and then be finely focused on the grain, which is clearly visible in the aerial image seen in the hole in the center of the screen. The edge of the hole serves as the unit's reticle.

Finally, there are parallax-type focusing aids available. These are similar in construction and eyepiece magnification to most screen focusers. They differ in that they offer a clear glass or plastic screen at the plane in which the image is brought to focus. There are markings on the clear screen. To focus with such a device, one first brings the image to the best focus possible by simply observing fine image details on the screen; then, by moving the head from side to side, the user observes

whether the focused image moves relative to the markings on the screen. If it does, it is out of focus and a focusing adjustment must be made. These devices can afford great focusing accuracy, but I find them to be a pain in the butt to use.

Of course, since you now have a matte-black easel (remember), it will be essential to use a focusing sheet. For maximum focusing accuracy always use the back of a piece of the exact same printing paper you are about to expose. This way, you will insure that the surface of your sheet of printing paper is exactly the same distance from the enlarging lens as your focusing sheet was. This is especially critical if you must use your enlarging lens wide open, where it has an extremely shallow depth of focus.

Printing aids. If there is any one area of color printing in which there is a maximum of confusion and a minimum of concrete information, this is it. Devices in this category constitute color printing's Catch 22. All too many people decide, on the basis of half-understood ad copy, hearsay, and the incredibly garbled advice of a photo shop clerk who is getting a sizable commission for each of such units sold, that they will go into color printing because the whole process can be handled completely automatically, without a real need for any skill or comprehension of what the process is all about. These poor souls are convinced that all they have to do is push a button or two on the wonderful machines they can buy, and the prints will automatically be exposed, processed, and pop out dry and ready for mounting. 'Fraid not, friends. There are a few sometimes useful printing aids, but none of them even remotely fits that description. In color printing as in basket weaving or belly dancing, either you know what you are doing, or your results will show it.

Printing calculators. Printing calculators are relatively uncomplicated little devices that are, under the best of circumstances, able to tell their users what printing filter pack and what exposure time is required to print a specific negative or slide, at some definite magnification, on paper from a specific emulsion batch, with a specific batch of chemistry, under a particular set of processing circumstances in a room at some specific temperature. If that sounds a bit more complicated than the way you may have thought of printing calculators up until now, what can I say

COLOR PRINTER'S BIBLE

but that you will have to change your thinking. Every condition I mentioned above, which was preceded by the word specific or particular, is a color printing variable. If you use a printing calculator on a Monday and get a good result, and then return to your darkroom on Friday and try to duplicate the print you got on Monday but fail miserably, it will probably be because you changed one of these variables. If you don't know what the variables are, and you don't know how to control them, you will have to use a printing calculator to make a test print just prior to every print you make. That means that you will have to make *at least* two prints for every one you hope to keep. This can be a very expensive, annoying, and time-consuming process. If you have read and understood the section on color theory, there is very little reason why you should entertain the idea of using a calculator. These devices are little more than crutches to get a timid printer to start printing. They are simply not needed once you understand what you are doing. However, after all of that, it might be a good idea if I describe what these devices are, how they operate, and what they can do.

Most color printing calculators are a collection of many tiny acetate CP filter segments, in a wide range of densities of all of the subtractive primary colors, arranged so as to provide a large number of filter combinations. These are all bound together in a frame, about 4x5 inches in size. In addition to the collection of subtractive filter segments, most calculators also feature a set of red filter windows of graded density, or graded neutral density filter windows. Almost without exception, these units are designed to be placed on a small piece of the paper you wish to make a print on and be contact-printed onto that paper by diffused light coming from your enlarger lens. This contact print is usually made with the negative or slide you wish to print placed in the enlarger's negative carrier and with the enlarger's head height set to get the magnification you need to make the final print. The image you wish to print is first focused and composed on the focusing sheet on your easel. Then the enlarger lens is set to a stop recommended by the calculator's manufacturer. The calculator is then placed on a sheet of unexposed printing paper, a diffuser is placed somewhere in the image-forming, light path, and the contact print of the

calculator is made under the diffused light of your composed focused image. Of course a filter pack, as recommended by the maker of the calculator, is placed in the enlarger's filter drawer, or dialed into its head, prior to making the exposure. All of this done, the contact print must then be completely processed and dried. Once dry, the color images of the many filter segments are visually scanned, and compared to a series of gray patches supplied with the calculator, to find a tiny segment of gray on the contact print. Once he finds it, the calculator user can determine what corrections are necessary to the filter pack to make an acceptable print of his negative or slide. The process of translating the position of the gray segment on the contact print to a filter pack change is either very simple and direct or very complicated and confusing, depending on which calculator you use and how your head works. The contact print is then again examined to determine which of the several red or neutral density filters was the last to leave an image on it. That data must also be translated, with varying degrees of difficulty depending on whose calculator you use, into the proper printing exposure time for an acceptable image.

Now, with all of this done, you can make the pack change recommended, and set your timer as determined, to make your print per the calculator's instructions. The chances are fairly good, perhaps as high as 75 percent in your favor, that you will come up with an acceptable print—if you have done everything exactly the right way while making the test contact print, and if you do all of your processing exactly the same way on both the test contact print and on the actual print itself. If you don't meet these requirements and you don't really understand the processes involved, you will come up with a weird-looking print and not have the foggiest idea of why, or of what you ought to do about it, except, perhaps, to go all the way back to the beginning of this long and complicated process and start all over again by making another test contact print. The best a calculator will ever do, under the best of circumstances, is get you to a filter pack that is about .05 or .10 away from the perfect one. So you will most likely have to reprint after your second print, in any event, if you really want to get the color balance right on the money. That means that you will have to make three prints (counting the initial test contact print) •

before you reach a final print.

This is where the Catch 22 of color printing comes in. If all you know is how to use a printing calculator to determine your printing filter packs and printing exposure times, you simply won't be smart enough to know how to correct your slightly off-color print. And if you do learn how to make the correction needed to get from, say, .10 magenta away, you will be smart enough so that you really won't need a printing calculator in the first place.

One further note on printing calculators is pertinent here. These devices are all based on a simple, and most often valid, assumption that any image you may want to print with their help will contain equal amounts of the colors red, green, and blue, and will be neither extremely high nor extremely low key. If you are into shooting monochromes, or even images that have one very predominant color (a fire engine, for example) among others, these devices won't be of any great use to you. They will be equally unhelpful if you tend to do much high- or low-key work.

Electronic analyzers. These are impressive-looking machines. Most of them have a number of switches, knobs, and dials, and a large illuminated meter to read. They are also expensive.

With such an array of technological goodies staring at a color printer, it is easy to understand why he might easily be awed into believing that if only he had such a wondrous device his thinking days would be over—that he could leave all his color printing problems to his electronic marvel. Once again, friends, I'm afraid it just isn't so, particularly for the beginning color printer.

Consider the one basic requirement that all analyzers, off easel or on, share in common: it is that the users of these devices must be sufficiently expert to make perfect color prints, all by themselves (or with a little help from their friends, or a calculator) *before* they can even *begin* to use an electronic analyzer. (Catch 22 all over again.) Now, consider that every one of the color printing variables (plus a few additional electronic ones) that could cause a color printer to come to grief with a calculator is also as great a problem to the user of an electronic analyzer. If after all that considering you still think that such a machine will relieve you of the necessity of understanding what you are doing when you make a color print, then you need help. I'll try to offer it.

"I have known several printers who let out terrific yelps the first time they put their eye to the eyepiece of a grain focuser, and then backed away from the device clutching their eye."

Electronic color analyzers do not require that you make a test print to determine the proper filter pack and exposure time to print a particular negative or slide. Instead, these devices look directly at the light from your enlarger lamp, after it has passed through the image you wish to print. They compare the color balance of that light to what you have told the machine the proper color balance should be, and tell you if the light's color balance matches the information you provided. If there is no match, the analyzer tells you how to change your color printing filters to achieve one. Color analyzers also compare the overall amount of light falling on their probes to the level of light you found you needed to make a properly exposed print, and tells you whether a match is achieved or, if not, what your proper printing time and lens opening ought to be to achieve one.

In order to tell the analyzer what proper color balance and exposure light level to look for, you must, before ever turning the machine on, make an absolutely flawless color print of a negative or transparency that you know

has been properly exposed and processed, and which contains certain other very specific information. If you are unable to make this flawlessly perfect calibration print, you will be unable to program your analyzer. If you can't program your analyzer, it will simply sit on its shelf, totally useless. If you think that you can establish a program for the device from data obtained by making a print that is less than perfect, you are right. You can. But, as with all computational devices—garbage in, garbage out. Every print you make using a less than perfect program will be less perfect than the less-than-perfect one.

Assuming you are able somehow to make a perfect print, you are now faced with a dilemma with regard to programming your expensive analyzer. You must now decide what to program it for. Of course, there are some analyzers that do not cause you this kind of grief. They are the type that read the diffused light output of your enlarger lens, just as their far less expensive cousins, the calculators, do. These electronic analyzers are designed to believe that all color images contain the same amounts of red, green, and blue that your calibration print did. This, as I pointed out in the section on calculators, is often simply not the case.

But getting back to the analyzers that do cause a programming dilemma . . . the more flexible ones can operate on the assumption just outlined above, or they can be used with a spot-reading probe to analyze a particular type of color situation. The most popular of these special color-situation programs is called "flesh tone." Once you have made your perfect print, if the image it contains has, for example, the face of a human being somewhere in it, you can insert a program into your analyzer that will make all succeeding prints you produce of human beings come out so that their flesh tones will match the flesh

tones of your perfect calibration print.

I won't belabor the obvious flaws in this kind of programming—what if your calibration print showed a Caucasian person, but you want to print a shot of an oriental or a black person, etc., etc.? I'll just mention that I've never seen any two people with identical flesh tones, and leave it at that. It is also possible to establish a program for any specific color, but here again it is rather doubtful that any future shot will ever have that specific color included in it, unless you put it there.

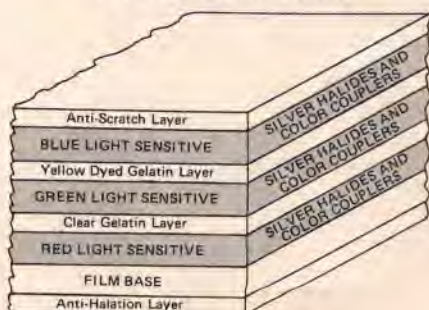
Perhaps the most useful of the programs that you can load into an electronic analyzer is the data on how you printed a perfect reproduction of an 18 percent gray card. It is not too farfetched to include a gray card in the corner of a frame of a subject you are shooting, or to shoot a full frame of an 18 percent gray card when you are working under the constant lighting of studio electronic flash or a hot-light set up.

At any rate, the choice of how you program your analyzer is yours. Some of these machines will store several programs internally.

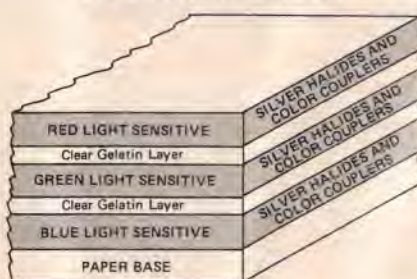
Whatever program or programs you do insert into your analyzer's memory will be applicable to prints made on paper from the same emulsion batch as the paper you made your calibration print on, which are processed in the same batch of chemistry, under identical conditions of temperature, time, and agitation. If you change any of these factors, you will have to make a new calibration print with the new materials or processing conditions or your analyzer will be providing you with inappropriate data. As a matter of fact, if you decide to change the type of color negative film you use, from the one originally used to make the calibration print with which you programmed your electronic analyzer, you will have to make a new calibration print from a new negative on the new film and reprogram your analyzer with the data so obtained.

I certainly do hope that the material above has gone a long way toward dispelling the myth that surrounds electronic color analyzers. These devices do work, and work well, but they don't eliminate skill or knowledge as requirements of color printing. They are simply another type of tool that is available to the color printer, but one which has no magical power at all. 

**TYPICAL COLOR
FILM CONSTRUCTION**



**TYPICAL COLOR
PAPER CONSTRUCTION**





WALL STREET

By CHARLES GATEWOOD

I began my illustrious New York career as a messenger for a Wall Street law firm. I used to pause between errands down in those granite canyons and look around and say, *goddamn!* The place was so grown-up and intimidating—but fascinating, too, in a weird way, like a stage set for a lot of very serious office people, and bankers and lawyers who looked like they were made for television.

Weekends were even stranger—just the black granite polished marble concrete glass and brushed steel monuments, cut by afternoon sun, disturbed by an occasional pedestrian. I thought of the Roman Forum during a circus or a disaster, when all but a few of the people were away. . . .

I began seriously and systematically photographing the Wall Street area in 1972. In 1974, the New York State Council on the Arts helped me continue this essay. It is almost complete now, and a book is in layout.

These are all Leica photographs, with wide-angle lenses and good-old Panatomic-X film.











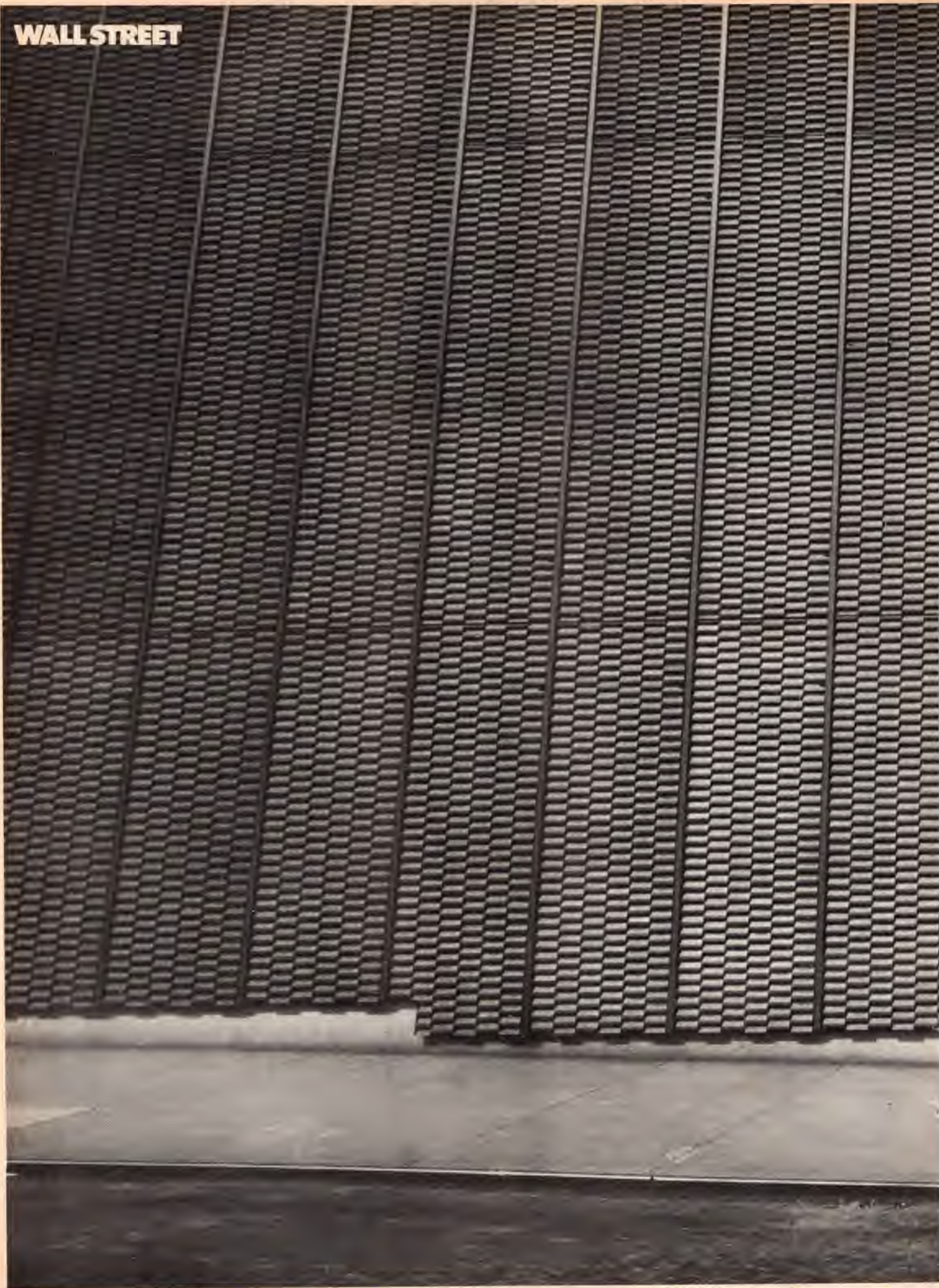








WALL STREET





CARBONATED PRINTS

A step-by-step guide to a once-popular non-silver process that offers dimensional-quality prints

By DARRYL JONES



Carbon print

In the hundred and some years of photography's existence, scores of processes for reproducing the photographic image have come and gone. But recently, there has been a renaissance of interest in resurrecting some of these earlier processes—tintyping, gum-printing, platinum printing, daguerreotyping, etc. Not only photographers with an historical bent, but a number of universities and summer workshops as well have been studying and practicing some of these antique techniques, with unusual and beautiful results. And with the increasing concern of photographers over the permanency of their prints, given further impetus by the growing realization by collectors that photographic prints are valuable as art,

two of these old-time processes should be of particular interest because they are two of the most permanent of all. These are the Carbon process, along with a derivation of it, the Carbro process. Illustrations appearing with this article were made with both processes, and are so identified. These prints are beautiful, containing a long tonal scale and rich buildup of pigments. The materials for such printing have not been commercially available for some time, but now are, so it is time to acquaint our contemporaries with this "lost art," so that they may experiment and produce Carbon and Carbro prints themselves.

First, what is a Carbon print and how does it differ from an ordinary photographic print? A Carbon print is produced by the action of light passing

through a negative onto a layer of gelatin containing bichromate and pigment, causing the bichromated gelatin to become insoluble in proportion to the amount of light that strikes it. When this layer of hardened gelatin is transferred to a final support (watercolor paper, glass, or many other types of supports) and then placed in warm water, the gelatin that is soluble washes away, leaving the insoluble pigmented gelatin in relief upon that support. The final image is permanent and will not fade in the presence of light, since it is a non-silver image. Because the gelatin is hardened in varying thicknesses, the print is actually three-dimensional. There is a true depth to this print that has to be seen to be appreciated.

Although this may sound complicated,

35-MM PHOTOGRAPHY



Carbon print

the principle is extremely simple: light renders insoluble a layer of gelatin that has been sensitized with bichromate. Since gelatin is colorless, finely powdered carbon or pigment is used as the coloring matter. Once the gelatin is hardened by light and washed in warm water, the pigment that is imbedded in the gelatin remains as the image.

A *Carbro* print is made basically similarly to a Carbon print with these exceptions: you put a bromide (ordinary) print in contact with carbon tissue and the chemical interaction between the silver in the print and the carbon tissue causes the local insolubility that permits color. There is an expanded discussion of Carbro printing at the end of the following description of Carbon printing.

SUMMER 1976

The history of Carbon printing

The history of Carbon printing concerns the use of these basic principles. Mungo Ponton in 1839 observed that paper soaked in potassium dichromate would be stained insolubly when it was exposed to light. Edmund Becquerel carried out further experiments and realized that the effect was because of the sized paper, so a definition relation was established between gelatin and bichromate. The first person to use this principle to produce a photographic image was the French chemist, Alphonse Louis Poitvein. He prepared a paper with pigment, bichromate, and gelatin, placed it under a negative and exposed it to light. The areas that received a lot of light were hardened, remaining on the

paper when he placed it in warm water. The image, however, was composed of solid areas and pure white areas, because the delicate highlights were washed off in the hot water. This high-contrast image was interesting, but the goal was to retain all the details that were present in the negative.

The honor of solving this problem belongs to Sir Joseph Wilson Swan. In 1864 he introduced the method of transferring the hardened layer of gelatin to another support, thus securing all the highlights. Because the glass plate he used could not be turned over (the thickness of the glass would cause a soft image), the final image was reversed. He, therefore, devised the double transfer method, whereby the gelatin image would be developed upon

CARBONATED PRINTS

The Carbon Process



Besides the carbon tissue and the transfer paper, Carbon printing requires a contact printing frame and some type of light source (a quartz lamp is shown here).



After the enlarged negative is made on Kodak SO-015 duplicating film, place a mask of 1-in. tape around the edges to act as a "safe edge."



The carbon sensitizer consists of only one chemical—potassium dichromate. The dilution controls the contrast, with a 5% solution giving an average image. Soak the pigment for 3 min. in the sensitizer.



Remove the sensitized pigment paper from the dichromate solution and squeegee onto either a ferrotype plate or a piece of Plexiglas. Allow it to dry on the Plexiglas or else hang it in a darkened room or drying cabinet.



Place the dried carbon tissue and the enlarged negative into a contact printing frame and expose to light. Use a fan near the frame to keep the pigment from becoming too hot, rendering it insoluble.



After the exposure, place the carbon tissue into a tray of cold water along with the transfer paper. When the tissue is limp, bring it into contact with the transfer paper. Lift them both together and allow the water to drain.



Put the pigment paper and transfer paper onto a sheet of glass and squeegee them together. Then place them on a sheet of newspaper, covering them with wax and a second sheet of glass. Leave this combination to set for 20 min.



Upon completion of the 20-min. transfer time, place the sandwich into a tray of warm water (105 F). Very soon, you will notice that the soluble pigment will begin to ooze out from between the sandwich.



Once the tissue begins to separate itself from the transfer paper, pick it up by one corner and gently remove it.



At first, the transfer paper will be nothing but a mass of dark pigment, but as the soluble pigment washes away, the image will appear.



You can further the removal of the soluble pigment by periodically lifting the transfer paper out of the water and letting the soluble pigment drain.



When the borders are clean and no pigment drains off when the transfer paper is pulled out of the water, the development is complete. The final image will consist of permanent pigment suspended in insoluble gelatin. The last steps consist of removing the dichromate stain and hardening the gelatin.

CARBONATED PRINTS

a temporary support and then transferred to the final support. Photographers today work in much the same manner as Sir Joseph Swan, except that modern negatives are so thin they may be turned over during printing, allowing the use of the single transfer method.

Carbon printing became very popular once the Swan improvements made it a straightforward and simple operation. Photographers were excited by its possibilities and promise, especially since it yielded permanent images. In 1868 Edward L. Wilson published *The American Carbon Manual* (now reprinted by Arno Press, Inc., 1973), in which he compiled for his contemporaries all the information and formulas necessary to produce Carbon prints. His excitement and encouragement will be evident in the following quote from his preface:

"One of the greatest hindrances to the progress of the art of Photography, is the doubtful permanency of its productions. It will become an immense power if we can overcome this objection. Its votaries have learned how to secure beautiful lights and shades; brilliant chemical effects and most artistic and pleasing pictures. Never before has our art shown greater progress if improvement; never before has there been such a thirst for information and thorough training exercised as at present; and yet what a mortification to every earnest photographer to feel that his efforts can produce nothing that will bear him honor and credit longer than a few short years!

With this in view, constantly staring us in the face, is it not strange that the growth of photography has been so great as it has, and its improvement so evident as it is?

It would be so, were it not that one ray of hope has beckoned us on for a number of years back, i.e., the hope that at no distant period we might produce permanent results. That hope is now fully realized in the Carbon printing process, several of which are described herein, by which we may produce permanent photographic prints."

Many famous photographers have worked very successfully with Carbon printing, among them Alfred Stieglitz, Edward Steichen, and Julia Margaret

Cameron. I have seen Carbon prints produced by Julia Cameron in 1865, and can testify to the beauty and permanency of the images.

For decades the Carbon process was used extensively to produce high-quality prints. Not only were the choice of colors almost unlimited, but permanent color prints could be made by combining three gelatin layers composed of yellow, magenta, and cyan colored pigments. All subsequent processes reduced the time needed to produce a color print, but they could never equal the permanency. Although beautiful in its own way, a dye transfer print has neither the permanency nor the "depth" of a tricolor Carbon.

We have given the advantages of Carbon printing, but why did it become obsolete? The use of small-format cameras with the Carbon process required the production of an enlarged negative. This extra step meant more time had to elapse before one could see a finished print. Also, a new technique was eventually devised that allowed Carbon prints to be made from bromide prints. This became known as the Carbro process, being an abbreviation of "carbon-bromide," hence "car-bro." The final image is exactly the same as a Carbon image, pigment suspended in hardened gelatin; the only difference is the technique used to harden the gelatin. In Carbon printing the bichromated gelatin reacts with light, whereas the gelatin of the Carbro print reacts with chemicals. All the Carbro process needed was an enlarged bromide, which could be used wet, bringing it into contact with the sensitized gelatin tissue. This allowed the 2¼ or 35-mm photographer the possibility of making permanent pigment prints.

The history of the Carbro process is allied with the history of Carbon printing. During the years that followed Sir Joseph Swan's improvement of the Carbon process in 1864, many experimenters worked with the basic principles and sought other methods of producing Carbon or Carbon-related prints.

Howard Farmer in 1889 learned that when bichromates are in the presence of gelatin, they can be reduced by finely divided silver. When a bromide print is placed in a solution of bichromate, the

gelatin that is in contact with the silver becomes insoluble without being exposed to light. This principle becomes the basis of the bromoil and Carbro processes, with the difference that in bromoil the insolubilization occurs in the gelatin containing the silver image, whereas in Carbro the insolubilization occurs in another layer of gelatin.

Thomas Manly experimented along this same line, introducing in 1905 the Ozotype and later the Ovobrome processes. The Ovobrome process is essentially the Carbro process, but it did not become very popular. It was not until certain refinements took place that the use of the Carbro process became widespread.

Carbro reached its peak of popularity in the 1920s and '30s, when there were approximately 30 to 40 different pigment tissues available. The Autotype Company of England was the primary source for supplies, although there were several companies in the United States that also made the tissues.

Tricolor Carbro was the color printing method that was used for advertising. Direct color separation negatives were sent by agencies to a master printer specializing in Carbro, and he would produce for them a superb color Carbro. The process made it difficult to produce many color prints, for each print required all of the same steps to be repeated. Dye transfer began to replace Carbro for color printing, because once the matrices were made the technician could produce numerous dye transfer prints in an afternoon. It was only a matter of time before the Carbro process became obsolete in the early 1950s.

Concerning this obsolescence of Carbon and Carbro is the following quote from *The Encyclopedia of Photography* (Greystone Press, New York, 1963):

"The following article on the carbon process has importance historically. Many photographs by some of the best photographers in the world were made by this process. Unfortunately it is now obsolete. In recent years, the principal manufacturer of pigmented paper for carbon printing, The Autotype Company, Ltd., of London, has ceased to supply materials for the process;



Carbro print

there is no other known source of carbon pigment at this time. It is unlikely that the average person could make and coat his own pigment paper in order to experiment with carbon printing. However, since many significant pictures were made with this process, many readers will want to know how the prints were made. We also refer you to various old books on photography for a fuller explanation of the process."

After a quarter century of obsolescence, the Carbro process currently is undergoing a rebirth. In contrast to the quote, materials now are available, and photographers are making both monochrome and tricolor Carbro prints. Dr. Robert F. Green has founded Gallery 614 in Fort Wayne, Ind. for the rejuvenation of Carbro printing, and he is supplying all of the necessary materials.

SUMMER 1976

In the Carbro process, a non-supercoated bromide enlargement is brought into contact with the sensitized carbon tissue. A chemical reaction causes the gelatin to harden according to the amount of silver present in the bromide. Where a dark or shadow area appears in the bromide, it will be reproduced as a hardened area of gelatin.

When this pigmented gelatin tissue is transferred to a final support and washed in warm water, the soluble gelatin washes away, leaving the image as pigment suspended in a layer of gelatin. This image is three-dimensional, for the varying tones are seen as varying thicknesses of the pigment. A shadow area will be very thick compared to a highlight, rendering a "sculptured" effect.

Although the final images are the same, there are definite advantages to the Carbro process. There is no

enlarged negative that has to be made, only a bromide, which is ready for use after washing. Once the tissue is sensitized, it can be used immediately instead of being dried first. Because the sensitized carbon tissue is hardened chemically, there need be no exposure with another light source—quartz, arc, or the sun. Similarly, the chemical hardening means that all of the steps following the production of the bromide can be carried out in normal room lighting. This is important, making Carbro printing a straightforward procedure that requires little or no extra equipment than what would be used in black-and-white printing. Once the bromides are made, there is no need for a darkroom; all of the Carbro prints can be made in the kitchen sink.

Since Carbro is a variant of the Carbon process and retains all of its virtues, why did it also become obsolete? By the beginning of the

CARBONATED PRINTS



Carbro print

second World War, photographic technology had been successful in making many high-quality bromide papers that offered the professional and amateur photographer simplicity and speed. Mass production techniques could be used by the photographer to supply his clients with the needed print. Time and speed became important governing rules, determining the quality and type of printing methods that would be employed. Photographers no longer had the time to produce either Carbon or Carbro prints. Quantity was the order of

the day, not quality; and so it has remained today.

Photographers are still rushed for time, but many are annoyed by the loss of quality. In their search for both quality and permanency, they are turning to old processes—gum printing, platinum printing, collotype, etc. Carbon and Carbro had been obsolete since the early 1950s because the carbon "tissues" (the paper containing a coating of pigmented gelatin) were no longer available. Today, however, a source has been located and Carbon

prints can be made by anyone.

I first learned about Carbon and Carbro from Dr. Green, who had read in old photography annuals about these processes and was interested in trying them, but he could not find the materials. It took two years of inquiries before he found a company in Europe that still made them. After placing a second order to the company, he was informed that they no longer would be producing the carbon tissues. Disappointed by this, Green visited the company and spoke to the president, urging him to continue manufacturing enough supplies so that the processes might survive in both monochrome and tricolor. The president agreed. All inquiries for supplies now go to Green at Gallery 614, 614 W. Berry, Fort Wayne, Ind. Gallery 614 displays Carbon and Carbro prints produced by those who are currently working with these media. The carbon tissues are available in the following colors: sepia, warm black, black, green, yellow, magenta, and cyan.

Producing a carbon print

Carbon printing can be divided into five main areas which will be discussed in detail. They are the following:

1. Enlarging—making an enlarged negative
2. Sensitizing/Drying—sensitizing and drying the carbon tissue (pigment paper)
3. Exposure—exposing the sensitized tissue through a negative
4. Transfer—transferring the tissue to a final support
5. Development—developing the image on the final support in warm water

1. Enlarged negative

Because a Carbon print is a contact print, one needs a negative as large as the final image. This means that one must make an enlarged negative; it has been considered a difficult task, but now it is no longer a problem. Several new films, such as Kodak's SO-015, are pre-exposed so that a negative can be produced directly from a negative. Anyone can make an enlargement from a 35-mm negative as easily as an 8x10 black-and-white print; even Dektol is used as the developer, and all work can be carried out under a red safelight. This means that the Carbon process is within the reach of all photographers who have

35-MM PHOTOGRAPHY

The Carbro Process



These are the basic materials necessary for the Carbro process—a non-supercoated bromide image, carbon tissue, transfer paper, and chemicals.



Cut the pigment paper at least 1 in. larger than the bromide print. Place it into the sensitizing solution for 3 min. Be sure to wear rubber gloves for this step.



Before the sensitizing time has elapsed, place the wet bromide onto a sheet of glass. Pour water onto the surface in preparation for the carbon tissue.



Remove the carbon tissue from the sensitizer and place carefully upon the bromide print.



Squeegee the carbon tissue to the bromide with a blade squeegee. Be sure to move the squeegee firmly but not forcefully, otherwise you will leave abrasion marks.



Place wax paper and a newspaper over the combination. Then add a second sheet of glass and allow this to "set" for 15 min. This is the chemical "exposure" that will harden the gelatin in proportion to the silver in the bromide image.

CARBONATED PRINTS



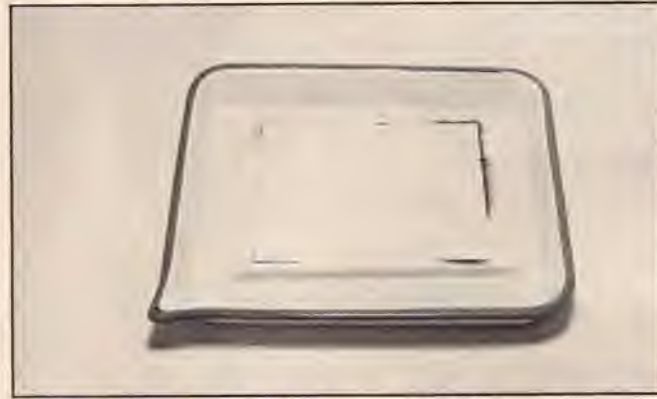
At the end of 15 min., place the combined bromide and the carbon tissue into a cold water tray along with the transfer paper. Separate the pigment paper from the bromide and bring it into contact under water with the transfer paper.



While holding the pigment paper and the transfer paper together, remove them from the water and allow the water to drain. Then squeegee the excess water.



Place the sandwich onto a newspaper, and then put wax paper over them. Add the second sheet of plate glass. The transfer will take place during the 20 min. that they are in contact.



After the 20-min. transfer, place the sandwich into warm water of 105 F. Make sure that the back of the pigment paper is on top. Within seconds, you will see the soluble pigment begin to ooze from the sandwich.

an enlarger (or who can borrow one).

As a rule, a good Carbon print requires a fairly contrasty negative. Make your enlarged negative accordingly, by altering the dilution of the developer.

Once you have a negative the size of the print that you want, take 1-inch black photographic tape and mask all sides of the negative. This will give you what is known as a "safe edge." Without it, the gelatin image could become detached easily from the final support during the warm wash.

2. Sensitizing/Drying

No formula could be as simple as that employed in the Carbon process. Only one chemical is needed to sensitize the gelatin—potassium dichromate. Contrast is controlled by the dilution

chosen; the standard dilution for average contrast is 5 percent, so dissolve 50 gm of potassium dichromate in 1000/cc of distilled water. If a lower contrast is desired, then a dilution of 6 to 7 percent should be used. On the other hand, a change in dilution affects the printing speed, and the more diluted the dichromate the longer is the exposure time. Weather conditions also affect the contrast; where weather changes can be severe, it is best to use 5 percent in the winter and 3 percent in the summer.

Cut the carbon tissue at least 1 to 1½ inches larger than the negative. Before placing the carbon tissue into the sensitizer, allow it to soak for 1 minute in a tray of cold water at 60 F or less; this helps the tissue to become pliable. Once it is limp, the next step is to immerse the

tissue into the sensitizer, which should be around 60 F. Leave it there for 3 minutes, dislodging any air bubbles from the surface with wet cotton. Rock the tray periodically to make sure that the tissue is completely covered by the sensitizer.

A word of caution about handling the sensitized tissue: Potassium dichromate is a poisonous chemical; it is best to use rubber gloves when immersing and removing the tissue from the sensitizer.

At the end of the required sensitizing time, lift the sensitized paper and place it face down upon either a ferrotype plate or a sheet of Plexiglas. Use a blade squeegee to remove all of the excess fluid.

If you are sensitizing only a few tissues, you can keep them on the



When the paper backing on the pigment paper begins to separate itself from the transfer paper, remove it by gently lifting on one corner. There will be a mass of pigment on the transfer paper, but eventually an image will appear.



In contrast to developing an image on bromide paper on which the image becomes darker, the Carbro image is dark to begin with and becomes lighter as the pigment washes away.



In order to help the pigment to be removed, lift the transfer paper from the water and allow the soluble pigment to drain.



The development of the Carbro image will be complete when all of the soluble pigment has been removed, leaving the image as a permanent pigment suspended in hardened gelatin.

ferrotype plates for drying, placing the combination into a darkened room or drying cabinet. For drying many tissues at once, you should peel the tissues from the plate and hang them up to dry. The tissue becomes extremely sensitive to light as it dries; make sure that it is well protected from sunlight. While wet it is fairly insensitive; however, do not use a bulb over 25 watts when you carry out the sensitizing procedure.

An alternative method of sensitizing involves the use of a "spirit sensitizer" rather than total immersion. In this case, mix one part of stock solution to one part of denatured alcohol. Use a piece of flannel cloth, a ball of cotton, or a soft brush for coating the sensitizer. Apply the "spirit sensitizer" with even strokes, giving the entire sheet two to three

coatings to make sure it is properly sensitized. Hang the tissue to dry in a dark enclosure. The alcohol causes rapid evaporation, allowing you to use the tissue within 30 minutes after it has been coated. This method demands practice and care, otherwise streaking will occur.

A final method employs the first method of sensitizing coupled with modern technology. After an immersion of 3 minutes, the tissue is squeegeed to a piece of .003-inch-thick transparent Mylar, making sure that all of the sensitizer is removed. This combination should then be placed between blotters, absorbing all moisture from the Mylar. Then put the two into the printing frame with the negative upon the Mylar. Expose the wet, sensitized tissue

through the Mylar. Although it is not as sensitive to light when wet, the gelatin will still harden and will yield fine results. The only drawback is the additional cost of the Mylar.

3. Exposure

To hold the negative and tissue flat you will need some type of contact printing frame. Place the sensitized tissue in the frame and lay the negative on top of it. Be sure to keep the emulsion side facing the light (opposite of normal printing), otherwise your Carbon image will be reversed in appearance. This procedure can be carried out under a yellow safelight.

There are various types of light sources for exposing the carbon tissue.

continued on page 107

Mimi

PHOTOGRAPHS BY DAN NELKEN

TEXT BY MIMI NELKEN

I don't remember exactly when I first realized that I was disabled, I was carried around so much when I was little. My sister always walked and I was always either carried or I crawled around, and that's just the way things usually were: she walked and I slithered.

I knew I was different because of people's reaction to me, but it took me time to realize why. I just remember being in general very frustrated at not being able to do what I wanted. I used to have temper tantrums simply because I was not able to make my legs work or keep up with other people. Once I was so angry at my feet that I bit my toe. It bled so heavily that the doctor had to sew it closed.

[Mimi had been injured at birth, coming into the world as a breech baby—feet first, not head, the normal position of arrival. A doctor delivered her with broken back and collar bone and injured spinal column, making her eligible to be a paraplegic perhaps for the rest of her life.—Ed.]

My family treated me very positively. I was loved and well cared for; nobody rejected me because of my disability. But my handicap was never discussed, which might have helped to put it to rest. No one ever asked me how I felt about

wearing braces and crutches or being different. I got the impression that it was a taboo subject, which made me feel uneasy about myself. My family found it hard to discuss important issues. Since I seemed happy and well adjusted to them, I tried to become what I seemed.

Since nobody really talked about my disability, I got the impression that they were secretly hoping for it to go away or that there was some reason to think I wouldn't always be disabled. I was afraid to ask my mother much about it so I tried to absorb all I could whenever doctors asked her about my medical history.

I was bussed to a special school; since no kids from my school lived in my neighborhood, I didn't see my friends much outside of school hours. This special school was for "Crippled Children," in big letters on the side of the building. This was where all the "crippled children" went who could be educated. At the time, it was compulsory to go there if one lived within the city limits.

Many people throughout my life have offered me the false hope of Cure, that with the right religion, attitude, whatever, I'll someday be able to throw away my wheelchair (or braces) and walk. I half believed it. When I was nine I asked my



A young husband's photographs of his crippled wife give visual insight into the world of the handicapped



father for a pony. He promised me one if I could walk. One neighbor we had, who was a "religious fanatic," came to the house one day to look after me and tried to heal me with her healing oil (it looked like chicken fat). She went into a frenzy telling me I was going to walk that day; she was so positive it would work. I was in a body cast at the time; I couldn't get away from her and my mother was at work. She kept rubbing her oil on my legs and praying; I hated to disappoint her but it wasn't working. My mother asked her not to come back.

When strangers offer me the hope that my disability will go away, they're only comforting themselves. It helps them to feel better. Most people need to pity me. Some people who aren't into pity want to see me as being especially

courageous. The challenge is not to see myself as being especially courageous. I really don't have courage; there just has never been any other way for me to behave than to live a normal life and to get ahead. I need to achieve for my own sense of worth; I could never be happy if I didn't accomplish anything, however slowly. The only people I feel at ease with are the ones who don't need to offer me anything, who are just themselves, and natural.

I got more attention than the average second child; I needed more. My sister, Marsi, felt envious and resentful. Sometimes she took it out on me; however, she was always helpful and never said no if I asked for something. She knew I wouldn't ask for help if I could do it myself. I know my family

would have gotten turned off if I had asked them to do things for me that I could have done for myself.

I developed artistically because I had so much time to be able to create my own world by making things when I was younger. Designing and making things was my way of being in control; it was my way of creating on my own without having to depend on anybody else, my form of self-expression. If I had been a physically normal child, I might have overlooked my artistic inclinations; I'd have been busy playing outside with other kids and having to conform. But being isolated, I had more of an opportunity to turn to whatever creativity was in me, to use it as an individual, to get familiar with it and get to feel at home with myself.

At 13 when I went into the local Shriner's hospital, I was going through my ballet dancer phase. I asked my mother if I could take ballet lessons when I got out. I guess she couldn't bring herself to dampen my hopes, so she said, "yes." Nobody told me I'd always be like I was. I had a lot of fantasies about being able to walk; I was a daydreamer.

Being admitted to the Shriner's hospital was one of the most frightening things that ever happened to me. When I was admitted, the doctors estimated that I would be there for about a year, the thought of which overwhelmed me. I didn't want to disappoint my mother by admitting I was afraid or try to back out. The doctors were hopeful for some improvement in my condition and both my mother and I felt too insignificant to question their plans. I spent 18 months in a place where we could at the time have two visitors every two weeks and were cruelly pulled from the windows on visiting day as we watched our families

arrive. I could not see my sister because she was only 17 (visitors had to be 18 and my mother wouldn't lie about it). There were no phones, no unopened mail, no outgoing letters—only postcards—no photographs, no privacy, no food from home. We had nothing from home but our books, which were sterilized in an autoclave. We all wore hospital smocks, no one left the ward unsupervised, and girls didn't see boys except from a distance. When my mother tried to find out how one of my three operations had gone, she was met with hostility from doctors and administrators alike. On weekends, the Shriners used to come to look at us, to see what their money was doing. We kidded among ourselves about being in a zoo. Life was repressed and frustrating. I was in there so long that many of my friends had their operations and went home; I had a different sense of time.

While I was in Shriner's, I developed and became a woman in the physical

sense—all while I was in a body cast. Before it was put on, I was really flat-chested; Marsi used to call me Flat-chest. When my cast came off, my breasts had developed. I guess I knew it was coming; I had always looked forward to it, but it was strange not to have seen it happen gradually. It was so metamorphic. While I was in my body cast, I also got my period for the first time—that was scary, to have that happen when I was away from home, to have all these changes take place in such an alien environment.

At that time, I was so vulnerable to circumstances. I would have had adolescent problems anywhere, but it was made so much more hideous by living in that environment for so long, feeling that life was going by me and that a normal life was not going to be mine. I knew my sister was going out on dates and hanging around with her friends; I wanted so much to do that, too. All I had was repression. And the sad part was that I got out of Shriner's Hospital after a



year and a half (with no noticeable improvement) the day after my sister's graduation from high school. I missed it by one day! I was heartbroken, but happy to be home.

When I left the hospital, I was absolutely out of it—psychologically debilitated and tremendously intimidated by the outside world, by life in general. Being free again and seeing people was too frightening for me. Once right after I was released, my mother and Marsi wanted me to go out to get some sun because I was so pallid. I wouldn't go. I resisted all efforts. I spent the summer inside our apartment just getting accustomed to life again.

In the fall, I dreaded going back to school—all my old friends were a grade and a half ahead of me. I had lost my closeness to them; I had to make new friends with the kids in my class. With the high school pecking order, the sophomores look down on the freshmen and that's where I was—starting over.

At Widener, our social pace often

paralleled our physical pace. The kids who could get around best were usually the most popular. When we were teenagers, we all felt funny about being with other disabled people outside of school. We never talked to each other about our handicaps; we were all trying to forget them. I always felt self-conscious about being visibly different; I think my friends did, too. In the area of education, we were segregated for our own "good" and with it all, little was asked of us; our abilities weren't maximized. I didn't take education seriously and probably for that reason it was not what one would call a college preparatory program. I would have had a real problem if I had gone from Widener right into college.

It was really on my mother's initiative that I considered leaving Widener at the end of 10th grade. I was lucky to have a family who expected a lot from me. It was expected that I would go to college if I wanted to, and would learn to lead a relatively normal life. I grew up to

behave like a normal person and be independent.

Since I wasn't permitted to go to the normal neighborhood school, we had to move out of the city into the suburbs so that I could live in a school district that accepted me. It was good that I was exposed to normal schooling even if it was just for 11th and 12th grades. I don't feel it did me so much good as it might have because I was educationally and emotionally unprepared for it. Widener was very small; I had known the people there all my life. At Abington school, everything was new and enormous. I first went there on a trial basis for three days. Those three days were so exciting; I was in a whole new environment.

Educationally and socially, a "normal" school was a real breakthrough in my life; it was the first time I really had to work to make myself fit into an environment that was not prefabricated for people like me. Abington wasn't prepared for me; it was built for able-bodied kids. I definitely wasn't



prepared for it; I had to accept.

I couldn't relate to most of the able-bodied kids, but I did manage to make a few friends. I had girlfriends and a steady boyfriend. His mother was vehemently against our dating, saying she didn't want her son pushing a wheelchair for the rest of his life. She engineered our first breakup. After a time he came back and we continued to date until we were ready to stop seeing each other. In time, I was able to confide in him about what my life had been like. He was astounded and at the same time quite compassionate about all I had been through.

My friends were kids who had problems too; we kind of gravitated toward one another. I think they were more understanding of me because their lives hadn't been exactly typical, either. I felt set apart by my values as well. I couldn't really get all excited over football or what other teams were doing. Teenage values turned me completely off. I had waited for so long to be "average" like everybody else, but now that I was getting a close look at what average was, I began to appreciate being different.

All my life I've always known I would be artistic. Besides being an art major in high school, I went to various Saturday classes for four years. When I applied to a local college of art for their B.F.A. program, I was rejected even though I had done very well in their Saturday program for two years. I found out later that I had been rejected because of my disability. It never occurred to me that my disability would prevent me from going there to college. I thought it was because my art work was not up to their standards, which in turn undermined my confidence in my artistic abilities.

After being rejected by the college, I felt defeated. Also, I was afraid that at that late date I wouldn't get into college anywhere. I applied to Pratt Institute's fashion department (since I still believed my portfolio was inferior). They treated me much more positively; I was accepted at the interview. What a relief it was to know I was going there.

My mother was most reluctant to send me away to New York City to college. I know she felt I was too vulnerable to be able to take care of myself. But that's what I wanted, that's what I got and so

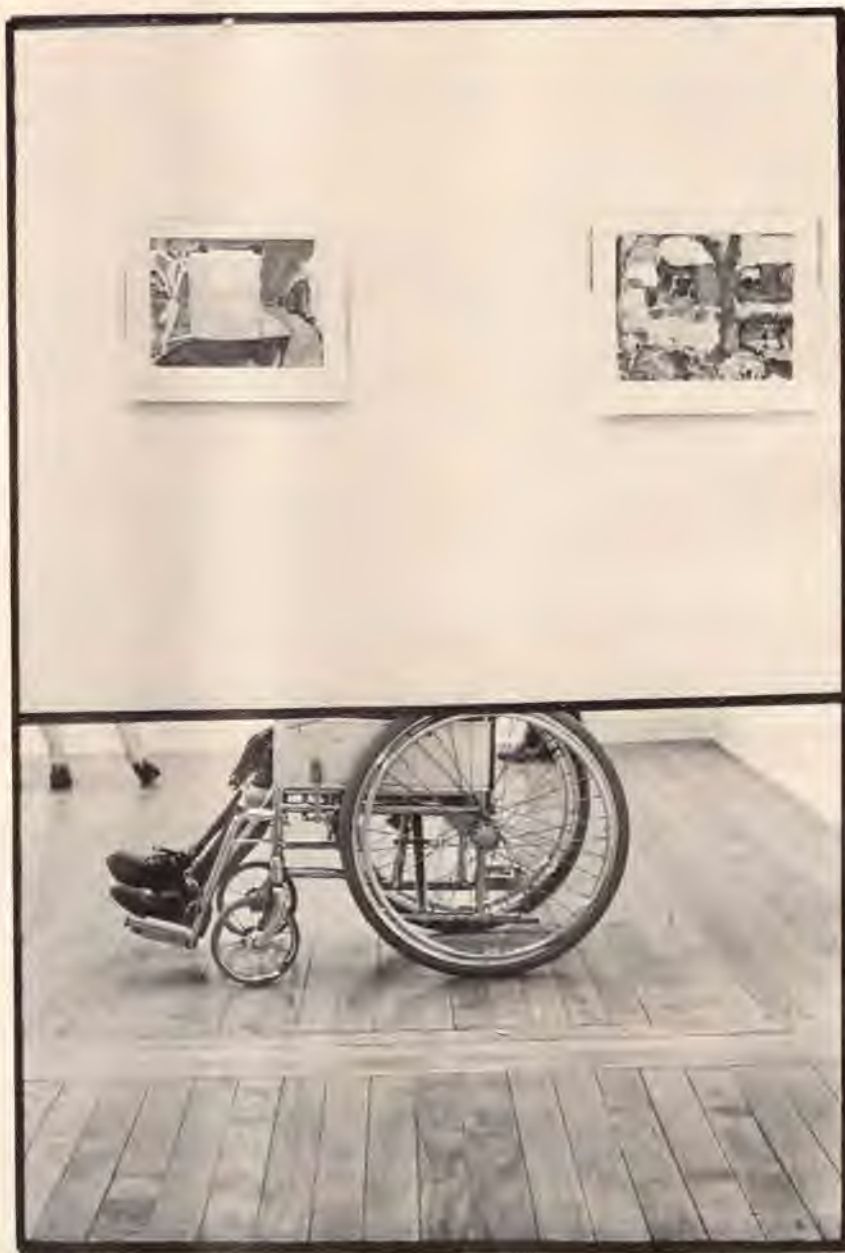
off I went. It was a terrific experience that first year. Things were so exciting, but not in the fashion department—I transferred to the fine arts program in the fall. Fashion seemed a waste to me; at 19, I was concerned that what I was going to produce would be lasting. With fashion, people don't want it from one year to the next.

When I started at Pratt, I was still very alienated and unready to let other people into my world. I wasn't ready to tell them why my life was at times more difficult than theirs or what truly got me

down. When I wanted friends, I really had to put forth effort to involve other people in my life.

Marcia was my friend in our freshman year. We had many good times together. Even as close as we became, I was still unwilling to help even her understand my really deepest problems about my disability—I hadn't even articulated them for myself.

One time I went into Manhattan by myself, walking, going by subway. I got off at West Fourth, bought three records and came home. That was the pinnacle





of my physical ability. I don't know how I did it. It took me a long time just to walk from the dorm to the subway. Walking one block was tiring—it took me 15 minutes to do each one! I'm slow and I'd have to stop every 10 or 15 feet just to get my breath. I never had the stamina to walk very far on crutches, and my braces weighed almost 20 pounds. When I got home, I flopped on the bed totally worn out. Then I knew how exaggerated my needs had become.

That year I was very young inside. I was living out my dreams of being like

everyone else. My friends could do these things with so little effort while for me it took so much more to be "normal." I had to get up an hour and a half before class to put on my braces and leave early to get to class whereas normal students could stumble in half awake and say they had just gotten out of bed.

Life wasn't all work there; I had met Dan and we did many exciting things together—going to museums and galleries. Dan made it possible for me to see and do much more than I could have

by myself.

That was life at school for four years. I had just started my fifth year and was still short on credits toward my B.F.A. degree when I sat down and decided I wasn't going to do it anymore. On the surface, I was dropping out of school; underneath, I was realizing that what I was putting into the struggle was not worth what I was getting out of it. I had lost the need to keep proving myself, I'd lost the need to keep hitting my head against the wall year after year. It wasn't the act of leaving school, it was the act of discovering what I needed, and I didn't need school anymore. Some of my teachers were telling me that they couldn't teach me any more, that it was up to me to be an artist; they were finished with me in a sense. I felt independent enough as an artist to leave the school situation and still use my talent.

My greatest discoveries and my most meaningful triumphs have been made when I have abandoned a traditional way of doing things. When I abandon an old form of behavior, I usually come out with something better than the original—for me, at least. I can only be into a behavior pattern until it stops working for me. After it stops working, I do something else . . . make another break with the past. Every few years I break with a way I've been behaving or an outlook I've had and go on to a more beneficial one. I think I'm lucky in my resilience to life. All the different changes that I've made in the past 10 years have all been important plateaus in my own development. I'm pleased when a departure comes. By the time it comes it's a welcome change.

How did it come about? Much of my liberation from my stoic ways can be traced to the short film Dan made about my attitude toward disability. Working on the narration helped me not only formulate some of my own ideals and self-image, but, more importantly, to overcome my fear of sharing my thoughts with outsiders. After narrating the film, I felt as though I had read my diary! But the audience responded so positively to the combination of Dan's cinematography and my narration that I was relieved to the point of exhaustion after the film's first showing. I felt a sense of peace; I wasn't rejected for





telling it like it was.

Two years later when Dan had a photo essay about me published in *Look* magazine, I had to overcome my aversion to publicity. I was reluctant to let him do it since I've always disliked being stared at or deliberately calling attention to myself. However, I did come to the realization that the publication of my activities was a way to change people's heads for the better. In letting the public see how I lived and thought, I could make them more aware of disabled persons in the future, perhaps leading to the elimination of some social barriers. When I looked at it that way, I refused to let my hangups stand in the way of progress. Since then, Dan's photographs of me have been in magazines all over the world.

It's been six years since the film was made. During those years I have become able to make friends on a more honest and realistic basis. Once when I was attending ceramic school for the summer, the elevator in the dorm broke. When my girlfriends heard about it at breakfast they came back to the dorm, carried me to my wheelchair down the flights of stairs, and on we all went to the workshop. Amazingly enough, I didn't feel uncomfortably indebted by the whole experience.

In 1971, Dan and I were married. Once in a while, we come across a person who doesn't expect me to be able to make Dan happy. One person even wondered what could be "wrong" with Dan for wanting someone like me.

Over the years, I have also become increasingly outspoken about the cultural stigmas and stereotypes surrounding the disabled as a group. I founded a local political organization for the disabled in which we work to make the public aware of our problems: architectural barriers, lack of civil rights protection, and other related areas. What prompted me to do that was my growing awareness plus the lack of leadership by the disabled themselves. Also, I was once forbidden to enter a store with my wheelchair. I called the Human Rights Commission, the American Civil Liberties Union, and everyone I felt could help. Their common response was: it's still legal to discriminate against you. I was angry and disheartened at having no recourse.

Several months later, I wrote an article for a Philadelphia paper's Sunday magazine that received so much positive response that I got the people I knew together to organize our group. Disabled in Action of Pennsylvania now has 75 members and is still growing. I resigned as president of its steering committee in my third month of pregnancy.

Being pregnant prompted a great many changes in me emotionally. All my life I had been afraid to become pregnant for a number of reasons. I knew it would be a giant commitment, a

lot of work, and would change our life-style considerably. Mostly, I was terrified that somehow the baby would be affected by my disability even though rationally I knew that one cannot genetically pass on a condition of injury. But I was still afraid for the baby. My doctor planned a Caesarean section from the beginning. I went into labor two weeks early. An hour after I got to the hospital, Ada was born. When I saw her in her incubator I could see she was perfect and I cried with relief and happiness. She brings us much joy. 









PHOTOGRAPHY'S PARTNERS

It takes more than a photographer to make a good commercial photograph

By BARRIE SAMUELS

Ever find yourself looking at a photograph in an ad or magazine, and wondering how the hell *they* did "it"? And just who is "they," anyway—the "they" beyond the film, camera, photographer, and model?

There's a whole other world of *them*—these partners in commercial photography—people like art directors, reps, stylists, location services, model makers, prop houses, assistants, retouchers, picture agencies. A photographer, once he gets an assignment, may need any or all of them—or even a home economist, a set builder, a makeup person, special equipment, or an elephant to remember it all. If you don't know too much about the functions of all these partners, then this article is for you.

Most of these partner people are free-lancers working for a day rate or fee, plus expenses. There is a great deal of overlapping between functions—the same person may do more than one thing; there is almost no set definition of what a function is, although everyone's got an opinion and interpretation. Many of these jobs are people jobs. They share, therefore, some of these personal characteristics: really liking what they do, patience, high energy and concentration, good taste, the ability to think fast on their feet, imagination, an ability to get along with people, and the ability to eke out what they mean from what they say.

Art director

Because most commercial photography is in advertising, we'll look at the Partners basically from that viewpoint.

A concept is born. The client (product-company) and ad agency come up with a layout (a sketchy or very detailed drawing) of how the finished piece will look. Let's assume that

everything's been done but the photography; the copy's (text) been written; everything's approved and ready to go. The photographic responsibility—hiring the photographer to make the image a reality—belongs to the art director. It is his job to communicate the advertising concept, particularly its visual realization to the photographer; he can work with the photographer up to and including the shooting if he chooses; it is then his job also to follow through into production.

Bob Nemser (best known as an annual-report designer), of Nemser & Howard, communications and design consultants, defines an art director as "someone who can decipher gestures, grunts, groans, and body language (in order to find out what the client really wants) and then is able to coordinate all the aspects of design, production, and a little ESP and come up with a viable solution *on time*." You have to figure out what they want. "You have to have patience and be a pessimist so that when the roof falls in, you sort of expect it; you have to forge on to get the job done." A good art director, he continues, "is someone who knows where and whom to go to to put the pieces of the puzzle together, and to convey what's in his head to the people who will help him create."

When an art director needs a photograph, he can hire a photographer, buy a stock picture (one that's already been taken), or shoot it himself. Factors affecting this decision are the difficulty of the picture, the time left before the deadline (too many are due "yesterday"), and of course budget.

Let's assume that there's enough time and money allotted to this assignment to do it right, to get it just the way it's envisioned, to have a photographer and staff all do their component parts. He's got to pick the photographer who he thinks will get the job done the best

according to the visual concept. It becomes a matter of style, and expertise in that style. Fashion, food, furniture, and femme fatales will all be shot differently by different photographers; some have a flair for one and not the other, though may be competent. But the art director wants more than competence—he wants the best he can get (for that job, at that time, for that budget).

If he's looking, for example, for a photographer to go into manufacturing facilities and shoot color, he must be sure that the photographer can control the different lighting situations; he must know color balance and filtering. He must be able to go from incandescent to fluorescent to daylight and back to mercury vapor with equal ease.

A photographer either has this skill demonstrated in his "book" or he hasn't; an art director can't really afford to take the photographer's word that he can do it. What if he can't? There's not the time or money to gamble. "An art director is spending the client's money to get the best possible job; you've got to be logical, not emotional," Nemser explains.

In addition to what he looks for in a portfolio, Nemser also evaluates the photographer's presence. This is important. The photographer is really representing the art director. In his perseverance to get the shot he wants, the photographer must be firm but not inflexible.

Nemser looks for a person who shoots the way he (Nemser) visualizes solving the problem. He doesn't tell the photographer how or what to shoot, but suggests something (usually something the client has asked for); he also tells the photographer to do it the way he thinks it should be done. Both solutions are then presented to the client. The client usually selects the photographer's solution.

This is a good example of how the art



Peggy Magidson on phone . . .

director must be a middle man between the client and the photographer. If he presented *only* the photographer's solution, knowing that it was the more appropriate one, the client would rightly wonder what happened to his suggestion. This way, both are presented. The client and the photographer have their solutions realized; the art director maintains the business of the client and the respect of the photographer, and gets the job done.

The respect must be mutual. "As a professional, the photographer's first obligation is to the art director who hires him, to come back to him with the picture, no matter the difficulty." The important thing is that the job be done and done well. "It doesn't matter how great the photographer is, if he can't deliver, he's not worth anything." The

SUMMER 1976

fact that it was cold or the camera was broken, or a new flu strain was in town is irrelevant; once the assignment is accepted, there's a strong professional ethical obligation to complete it as agreed.

It is up to the individual art director how involved he will get with the photographer during the setups and shooting. Nemser usually doesn't see the photographer until he comes back with the pictures. "The most frustrating thing about that," he admits, "is that photographers have a tendency to over-edit, often leaving too little to choose from. I would much rather they give me a preliminary edit and all the stuff they've edited out. I find that photographers cannot edit their own stuff *easily* in most cases, and I'm speaking as a photographer also."

Reps

Just as there is no one way to do a creative assignment, there is no one way to "sell" a photographer. Selling the talent of the photographer to the user (generally an art director or picture editor) is the function of the photographer's representative—"rep."

Reps are in, out, and back into every potential photographic marketplace—ad agencies, magazines, book publishers. They sell their "talent" (they call their photographer their talent) by phoning art directors, making appointments, and showing a "book" or portfolio. The book shows the photographer's work as it's been used in ads, catalogs, book jackets, promotion pieces, editorial spreads, etc. The art directors look at the work in terms of their immediate and future need for that type of talent. Just as the art directors remember what work a rep shows them, a good rep also keeps track of what was shown to whom, when, and what happened.

A rep is not only the line of communication between the art director and the photographer, but its translator as well. In order to accomplish successfully this line of communication, a good rep must understand both sides *and* the middle to an uncanny degree. He must understand the *realistic* range and nature of his talent's abilities; he must understand the language of the art director—advertising, layout, production, budget, deadline—with all its inherent and potential problems; he must understand everyone's likes, dislikes, taste, creative limits, and communicate and mediate between them, avoiding oil-and-water immiscibilities wherever possible. He must understand



and pressing garment for model.

"A rep is not only the line of communication between the art director and the photographer, but its translator as well."

photography and photographers, psychology and people, advertising and art directors, and he must be able to handle the strangest and most stringent unpredictables with the ease of a conditioned reflex. Yet, being a good rep is a seemingly easy job. . . .

To Bob Nemser, who sees lots of them, a good rep is "one who anticipates the needs of his client (now the art director) . . . you don't have to draw a diagram—he can size up your problem, solve it really before you tell him what it is; he has an inner sense about the business." He adds that a good rep "must instill confidence that he understands your problem, that he'll get it done, and supervise it, and that it'll be right." That's the way the reps see it too.

Physically, the rep travels from art director to art director, not only showing his wares and discussing the state-of-the-art, but gathering "intelligence" information as he goes: who's doing what, who's been promoted or moved, who's ripe for some new ideas. The more people a rep can see, the more chances he has at a job. He knows just how much technique, etc., to reveal to an art director, and he knows where to stop. Sometimes directly, sometimes indirectly, the reps with their super samples influence and contribute to the idea banks of the art directors.

A rep may represent one talent or several, and the relationship with each one will be different, depending on what each one wants out of it. Whether one talent or several, the scope of the relationship can range from the rep being a simple transporter of the portfolio from agency to agency, to an involved professional, but personal, interrelationship and friendship. Sometimes a rep has to be a combination of priest, big brother, and business manager. Depending on the relationship, he may have to be more of one than the other. Some photographers may need more help with running their studio, say, than with relating to clients; some just require salesmanship and taking the book around. The degree of involvement is up to the two of them. And each one's different, even if the rep's the same.

When a rep serves more than one photographer, there is no conflict of

interests, because there is no conflict of talent. The photographers will be specialists of different types—fashion or food or still life or people—and have different styles—realistic, abstract, soft, geometric. When a rep makes an appointment with an art director, if there's a specific project in mind, then chances are that one of the rep's photographers will be better suited than the others to make that art director's vision real, in the way he'll want to see it.

Picking the right talent for the right assignment is like picking the right tool—for the rep and for the art director. Experience and involvement are crucial. As are respect, trust, and confidence to the success of a rep/talent team. This must flow easily and strongly between them, and subtly be passed along to the art director so that he can feel confident and comfortable when giving them an assignment.

The bond between the rep and the photographer must be strong and secure, as they feed from the same basket: a rep is paid a standard 25 percent of the photographer's fee, before expenses. Each must feel that the other is doing something necessary for their success, that he cannot do, and that is being done as well as *he* is doing *his* job.

He must be able to sit down with his photographer when there's a problem and say, "Hey, how can we overcome this problem?" He must be able to do the same thing intelligently with an art director. Being able to read the people involved, and having the perception coupled with enough technical experience to make both their jobs easier, can make or break a rep. Establishing this comfort and confidence leads to more assignments, which leads to being able to bill higher. Which is what it's all about.

Once a rep gets an assignment for a photographer, he will stay with it until it's completed, on time, to the satisfaction of the art director and the client. Getting the job, to many reps, is only the first step. They are involved with the production from the smallest detail to the general overview, insuring that both their talent and the art director get the best possible.

At a shoot(ing), for example, some

reps will stay in the background and watch, while others will use the opportunity to sell the next job to the agency and/or client people there, simultaneously protecting the photographer from distraction, and supervising the staff if necessary. A good rep knows everything that's going on. If a client is satisfied, comfortable, and confident, he'll tell his friends—and be back again.

In addition to the calls and appointments, reps promote their talents with direct mail pieces—tear sheets, announcements, mini-portfolios, posters, calendars. It might be a memo to art directors accompanying a particularly nice editorial series, informing the recipient that this appeared here, was shot by his photographer, and perhaps he would also like to see more of this work.

In gathering these impressions, I spoke with a handful of people recommended to be representative of reps. Some are still repping, some are not.

Nob Hovde (who prefers to be called an agent or representative rather than rep) represents: J. Frederick Smith, Michel Tcherevkoff, Malcolm Kirk, Reid Miles, and Claude Guillaumin in the area of still photography, and a film production company.

To him, the job of an agent is "putting people with people, getting the right talent together with the right art director." To do this well, he knows advertising, knows people (in acquaintance and knowledge terms), and has good taste; he knows good pictures when he sees them, knows whether or not they belong in a portfolio, and knows where good pictures will sell.

An account supervisor in an ad agency for about eight years, he understands his clients. This training in advertising, combined with his ability to sell and a desire to be in business for himself resulted in the agent he is today. "It's better to know your client's business as well as or better than they do," he believes. So, in effect, he became a supplier to advertising.

He does his homework, knows what accounts people are on. Like any good agent, he takes whichever book is most appropriate for the appointment; if he



Bob Nemser working.



Nob Hovde bicycling.



Michael Kempler smiling . . .



and the Kempler furniture.

later sees that another one might be more applicable, he makes a minor pitch on the way out to come back with it later. *Lee Gross* represents: Eva Rubinstein, Mary Ellen Mark, Marvin Lichtner, Allan Pappe, and Roddy McDowall. Because she covers magazines and advertising, she has to tailor her presentations even more. If the presentation is too editorial, she won't get advertising work, and vice versa. "In advertising, one must demonstrate that the photographer can control all the elements of a situation, that he can create a situation and a mood so it will look candid if that's what they want."

She develops each photographer individually and gets them work individually. She is a friend to her photographers, and feels that one can

do a perfectly good job of repping without getting personally involved. *Edith Leonian* reps her husband Phillip Leonian exclusively. Originally a picture editor who wanted to be a photographer, she ended up as a very involved rep in a marital as well as photographic partnership.

She is different from most reps in several ways: She doesn't make cold calls anymore, but will go to see someone when they call her. Calls for her require less follow-up because Phil's work is unique and they remember it. When she does see someone, she stays longer because his work is complex and takes time to explain. Not only is it complex, but so different from most that there are lots of questions to be fielded—some answered, some not. Her

calls consist of as much education as selling—art directors often need help in figuring out how best to use his work. When making calls, she uses a little cart to haul the portfolio around so as not to suffer from "one-shoulder-lower."

With all these differences, she admits that for the typical rep the typical approach is probably best: basically it all comes down to lots of phone calls, walking around and seeing people; it's very tiring and very physical, the samples are heavy. It's a game of averages: the more people you see, the more likely you are to be called. Part of this depends on how fast you get in and out of appointments. . . . "If you don't know where you stand on the way out, you've probably wasted your time. If they (art directors) want to find out how best to use you, the time is well spent."

She also thinks that photographers should try selling themselves for a while to get a realistic attitude toward customers and also toward the rep, to get a good idea of what the rep will be up against. Theoretically, you're in competition with the very best; and that "best" is out after the same dollars. "Getting a job is usually a thing of being in the right place with the right work at the right time."

Jay Ordan is almost another category because representing photographers is not his major occupation. Ad Sources Inc. is an association of five representatives employed by him, representing talent in major U.S. markets. The photographers represented by this group are: Allen Lieberman, Alan Winston, and Don Getsug.

A good rep must be "able to estimate what the real talent of a photographer is and also be able to understand what the artist *thinks* his talent is. He must constantly be able to mediate between his picture of his talent and the world's picture of his talent."

"The faith that the talent has in the rep's judgment—business *and* aesthetic judgment—has as much to do with their success in producing commercial assignments as the quality of the talent itself." His "ability as a *communicator* on the details of an assignment, the accuracy with which he can transmit the wishes and words of an art director into a job plan that his photographer can follow to the successful conclusion of the assignment can make him or break him. The icing on the cake is the aesthetic talent and taste level of the rep himself," says Ordan.

"As a matter of fact, if anyone is the elephant of the industry, it would be the stylist who should remember everything he's seen, and where."

Picture agencies

A picture agency is basically a library of pictures for sale, but also obtains jobs for photographers. The line between a rep and a picture agent is fuzzy. The consensus seems to be that a rep services an individual photographer to a greater, more personal degree while a picture agent handles more photographers with somewhat less involvement. Also, the term "rep" is used more for someone who sells to advertising markets while "picture agent" connotes a more editorial function. It's the same portfolio-carrying, but to different places.

When a photographer goes out on assignment, he may shoot hundreds of rolls of film. There are lots of leftovers. Putting them in a central collection, more accessible to more people, increases his chance for sales. An individual photographer could never get the mileage out of the collection that an agent with an active library does. The agent edits, catalogs, and indexes these "stock photos," and makes them available to publishers, researchers, picture editors, art directors.

When someone needs a picture of something specific, they may call and ask for it, or come down and look through the files. Depending on the collection, it could be a portrait or a place or a cow grazing in an orange sunset. The price of a picture is determined by the intended use and/or by the ASMP (The Society of Photographers in Communications) guidelines. Price depends on usage—the size of the page, the rights purchased, circulation of publication, and number produced. An agent will usually get 40–50 percent on a straight stock sale, justified by his overhead (salaries, rent, editing, indexing, etc.).

When people "buy" a photograph from a picture agency, they are technically renting it. The reproduction rights are sold to them for a *specific purpose*. Rental ceases when the reproduction is made and the picture returned. *Woodfin Camp and Associates* (30 Rockefeller Center, N.Y.C.) Woody Camp and Midge Keator are partners in this picture agency. "I am an agency. I represent photographers and maintain

files," Woody Camp defines. A picture agent is a person who helps photographers sell pictures and get jobs. They do this either by representing the photographer to gain a commission by taking his portfolio to magazines, or by selling something a photographer has produced independently. If the pictures group together into a theme or story, they may try foreign or domestic magazine or textbook markets. The library is as carefully captioned and indexed as time and money allow.

Camp takes an approximate 10–50 percent commission for this, depending on what's involved. The ownership and rights go to the photographer. If something large like a book contract is being negotiated, then the fee structure more closely approaches the 10 percent of a literary agent. If a photographer is sent out on assignment as a result of their efforts, then the standard rep fee of 25 percent plus expenses applies.

Camp and Keator maintain a 35-mm slide library, in plastic sheets, in filing cabinets, broken down sometimes geographically, sometimes abstractly. For example, a picture of a Japanese steel works may be filed under "Japan" as well as under "Industry." They also have files of black-and-white prints.

There is a fee of \$1,500 for a slide that's either damaged or lost. They have a pretty complete range of subject matter, except for microphotography or underwater pictures, and a good collection of American business leaders.

Woodfin Camp & Associates is owned by individuals; it is a Black Star rather than a Magnum, which is a photographer-owned cooperative.

Photo stylist

The rep has gotten the job—a layout and a go-ahead. There now exists the significant gap between the layout and the photographer's final setup. The layout may be a rough sketch with only an indication of the concept, or highly detailed requiring only the final photographs to be dropped into place.

The photo stylist fills this gap. She may be hired by the rep, photographer, art director, or even the client. She may do everything necessary to turn the layout into a reality, or just part of the work. "Everything" may include finding a

location, casting a model, propping the set, coordinating the clothes the model will wear, hiring a home economist, making a model, or finding that elephant. As a matter of fact, if anyone is the elephant of the industry, it would be the stylist who should remember everything he or she has seen, and where. Stylists generally concentrate their energy in the areas of fashion, illustration, and still life. *Fashion* is choosing, accessorizing, coordinating, and altering clothing properly for photography on the set. *Illustration* is propping—finding all the elements allowing the photographer to show animals or people in a situation; casting; location-finding.

Still life is finding, sometimes arranging and coordinating, objects and/or products to help photographers make interesting still lifes; that could mean anything from treasure hunting for rare antiques to washing dishes.

The art director (and/or client and/or photographer) will have something very specific in mind—color, tone, weight, style, fabric, and so on. The stylist must find it; borrow, rent or buy it; bring it back to the set, fit the model(s), make sure everything looks fresh, fit, and natural throughout the entire shoot—to the satisfaction of everybody. Light stuff? Try it. We all know how difficult it is to find the right clothes for ourselves—we look and look. Imagine how difficult it is to get something for someone you don't even know (a model)—according to a description or sketch no less.

Sometimes a client, an art director, and a photographer will all give a slightly different version of the same idea. Opinions may vary from "print's O.K." to "no prints" to "red!"—all for the same item. She must figure out what she thinks is right for the job, based on her experience, then also satisfy the others. She is, after all, allowed to bring back more than one item. And probably will.

A good stylist must stay right on top of the latest fashion and trends—ahead if she can. She should have a good idea of who's showing what—designer collections on down. She must know what's available where, and the "attitudes" of the different lines of clothes. When she gets an assignment, time is of the essence. She is being paid for her time—which entails her



Elsa Harrington selecting photogenic leaves . . .



Shelley Clayman, Welbeck Studio, retouching.

SUMMER 1976

resourcefulness, her ability to seek out and find whatever it is that's needed—fast!

Once she has a description of what's needed, she begins the fashion-house hunt. When she finds the something she thinks is right, she either borrows it, rents it, or buys it. (She will have been told whether the client wants to rent or buy.) She can borrow clothes from the designer houses if she assures them on-page credit. You know, you've seen "dress by blahblah" in the magazines. Or she can just outright buy it, wholesale of course. It's important to know where to go for what she needs, but perhaps more important to be able to think of a viable substitute if necessary.

In addition to the clothing itself, she is generally responsible for accessories—the scarves, jewelry, hats, shoes, bags, belts, whatever it takes to complete the assigned fashion picture. This must be accomplished in the taste and context of the client's advertising premise and market. At the shoot(ing), she is responsible for how the clothes look on the model. She fits the clothes by *pinning* them: instead of altering them permanently with needle and thread, wherever possible she pins them together temporarily out of camera-sight. The clothes must appear to fit snugly, wrinkle-free, creases only where approved as natural looking. A photograph registers everything, so subjects must be as imperfection-free as possible. If something isn't imperfection-free when it's photographed, it gets retouched later. This aspect of styling saves substantial retouching fees, and justifies the stylist's \$150-225 day rate.

In addition to pinning a shirt for a snugger fit, a stylist may put a piece of elastic over the hips, inside the pants, so the shirt "sticks" and stays when the models move.

Quality materials, by the way, photograph better than less expensive ones. That's one reason why models in photographs (even when they're advertising the shirts off their backs) are always so well dressed.

Propping is so much a part of styling that the terms may almost be used interchangeably. Props are the objects needed to make the set look realistic. If it's a cocktail party, the props will include everything from the glassware, flatware, dishes, napkins, table, tablecloth, food, everything to make it look as though the photographer walked in on a real party and took a picture of it.

If it's an ad for an expensive perfume

"The location manager calls the weather bureaus and Chambers of Commerce wherever he thinks there might be snow—Oregon, Colorado; Canada or Alaska if necessary."

and the lady holding the bottle is leaning against a collector's-item car with a real estate in the background, the stylist must arrange for all that—sometimes including casting the lady and coordinating her fashion.

A good stylist has everything and everybody at the set properly and on time; provides a good selection; handles things in a professional, efficient manner so that the photographer is unhassled and everybody's happy.

She can't afford mistakes. She can't afford to have gotten the wrong color tablecloth, or to have forgotten the napkins they forgot to ask for. While she's out getting the right color, everyone's standing around, being highly paid for their time—photographer, models, assistants, agency people. Mistakes can be very expensive, even though they're apparently small.

A good stylist should have common sense, a good, broad education and be aware of what's happening, a very good imagination, a knowledge of what's available, the ability to think on her feet, a knowledge of sewing, all combined with a skill for finding sources.

Many times she's hired for her good taste, her good aesthetic sense in choosing the things people like. She must have the ability to search and research, and to guarantee accuracy if necessary.

A good stylist is unlimited in the sources and services she'll use to get the job done. She'll use assistants, messengers, a seamstress, a hair stylist, a makeup person, location service, libraries, references, friends, model makers, prop houses, fashion houses, antique shops, furniture showrooms, art suppliers, laboratory equipment suppliers, circus people, zoos, any one and any thing.

Number one on her list of working tools is the telephone, followed closely by taxis. She'll often find what she needs in the yellow pages; she keeps a "source book" of her own findings, and a collection of catalogs. If she does beauty makeup, she'll have a professional makeup kit; if she does character or trick makeup, it may include things like a jar of latex for restructuring faces. She may use a Polaroid camera to bring back a picture if the object itself

is unwieldy—like a house. Messengers are indispensable for the too-heavyies.

She is an expert on preparing and cleaning objects to look perfect on film, knowing that some print patterns on fabric will run together on film while others will remain beautifully distinct, stuffing luggage to make it look full, polishing fingerprints off glassware, jewelry, etc., adding a touch of style or interest or class, if the picture calls for it.

Depending on her abilities, the job of styling will go as far as she can take it. She can, if she can, build models or construct sets or find locations. Styling has the basic function of turning the layout into a real set. The amount the individual stylist does is up to her.

Peggy Magidson is a photo stylist with an artistic background, or rather an artist who supports herself by photo styling. Her scope as a stylist is enhanced and broadened by her artistic skills. She does fashion coordination, propping, construction of props, casting, and location finding for fashion, still life, and illustrative photographers. She does makeup and loves costuming. She talks fast, moves fast, works fast. She is energetic, enthusiastic, resourceful, has the ability to adjust her good taste to the needs of the job; she is quick, honest, and responsible.

Part of *Peggy's* versatility is her ability to do so many different things; if something took less time and effort to make than to buy, she would make it. She gets paid for her time and expertise, and she believes in giving whatever applicable talents she's got in that time. "Part of the charm and challenge of the job is the unpredictability—you never know what part of your experience will be called upon. Or when. You've got to be able to think on your feet."

"You've got to know where to find something instantly . . . or people who make things if it doesn't exist . . . or people with station wagons who may charge less than messenger services." Saving the client money without cutting corners on quality is part of her wide-angled job.

Food stylist/home economist

The terms are usually interchangeable. Like any stylist, she turns a layout into a setup. She prepares

the food according to how the art director and the client decide they want the food to look. If there's a recipe involved, she prepares it.

The food must look nothing short of mouthwateringly super. Fruit and salads, especially, must jump out of the page in the magazine as the reader flips through; the reader must stop and wonder, "How did they do that?" The food must look appetizing, appealing, perfect, and real.

If the layout shows a salad, every piece and every leaf must be hand-chosen beautiful—color, shape, veination, unblemished, firm, round, high. The colors have to be perfect, and the pieces perfectly arranged.

Because food wilts and fades under the hot photo lights, a home economist generally will get four to six times the amount needed. If, for example, they're shooting an avocado, they may go through cases and cases before the right one is found. This one is set aside. A similarly shaped one is then taken out, cut open, treated exactly as the real one will be, and set under the lights. This "practice" one is called the "stand-in." The stand-in can wilt, droop, cry, or dry and it doesn't matter. Its purpose is to establish the best lighting, exposure, and arrangement. An avocado or tomato may fade, watercress collapse, lettuce leaves wilt, and other things droop or die (which means dry). The home economist must watch for these things, in the real shooting, and replace them as they slip from perfect to imperfect.

A good food stylist should have experience, an understanding of cooking and foods, a sense of humor, patience, an eye for color and composition, strong legs and back, the ability to get along with people, ability to think quickly, and a good grocer (to supply nothing-short-of-perfect fruit and vegetables).

Elsa Harrington is a semi-retired, free-lance home economist/food stylist. She is sweet, experienced, expert, patient, good humored, warm, loves her work, and gets along with people.

Preparing food for a photograph is "like composing a painting—you try and get your colors and arrangement right." The food "must look so pretty and so good that people will stop and look at it."



Rosemary Kait assisting.

Anybody can throw food together. The main idea is appeal." Everything must be edible and look lusciously delicious.

When working with a food that comes from a package, it must be shown exactly as it comes from the package. Cereal, for instance, must be poured straight from the box—as is. The larger flakes can't be picked out; everything's got to be real. If a package of frozen chicken has a certain proportion of white meat to dark meat, then any photograph of this product must have those exact proportions.

Because the camera catches everything, you have to be as meticulous with food as with stray hairs or wilting flowers. A piece of pie, for example, may change in size from the stand-in to the final. "Cakes must be cut perfectly. You work with a ruler—you measure the width of the back and the length from the center of the back curve to the point. If you cut something crooked, it will show. The cut must be sharp, clean,

natural, and perfect." A pair of scalpels are her favorite tools for very fine, precise work.

You have to be prepared for anything, and be able to think quickly when it happens. She likes to have about six times more than she needs. "This works out when you're working late and the stores may not be open." Even if they are open, chances are they won't have the beautiful stuff you need. A good home economist almost "mothers" the food, watches it very carefully in case anything happens. Watercress, for example, collapses quickly; it has a fast droop-time. Parsley, on the other hand, holds up beautifully. Experience teaches you these things, and there's just no substitute.

Prop houses

If you wanted to rent moose antlers, a Victorian toilet seat, or an authentic Egyptian necklace, where would you go? Alaska? Egypt? Back in time in a rented

time machine?

You would go to a prop house. Stylists do. That's the "in" place for out-of-the-way objects. Peggy Magidson says a prop house is "like a zoo that doesn't talk back; you could get an egg with green feathers on it if you needed one." The message being, if you'll find it anywhere, it'll be in a prop house.

Although a prop house technically is any place you can rent a prop, there are special places that service the photographic and theatrical industries. These special prop houses make it a point to have everything a stylist, for example, might want. Collections of antiques, furniture, authentic art objects. The objects can be offbeat or unusual to downright weird and horrifying. It depends on the need. Something as simple as a parachute or beach umbrella to a monkey-riding-a-hippopotamus lamp.

Specialty shops and stores will often rent to photographers for a percentage of the retail price—usually 10-30 percent for up to about a week. Rentals are profitable as the objects are returned, usually in the same excellent or new condition in which they left. A TV or stereo unit rented for a photograph may never even be turned on; it will sit on a shelf or floor, have its picture taken, make money for the store, and still be salable as new—because it is.

Each situation is of course different, depending on whether the people know each other, have worked before, have similar experiences, etc. Generally a deposit is left; sometimes the item is paid for before it leaves the store. When it's returned, the rental is subtracted along with the cost of any minor damage. Generally, the pick-up and delivery is up to the stylist to arrange.

Some things are fairly obvious. A guitar can be rented from a music store; a scuba tank or tennis racket from a sporting goods store; there are places that specialize in uniforms and costumes—a tin man, a warrior, or a policeman; and places that specialize in live and stuffed animals.

Furniture

The George J. Kempler Co., Inc. (160 Fifth Ave., N.Y.C.) is a "closed" furniture showroom—30,000 square feet full of furniture, fake plants, lamps, mirrors, accessories, paintings, prints, and problem solving. Jerry Moriarty (pronounced without the "i") is the problem solver. He designs all the rooms and handles all the rentals. Although the largest chunk of their trade

"A picture agency is basically a library of pictures for sale, but also obtains jobs for photographers. The line between a rep and a picture agent is fuzzy."

is designers and decorators, more and more photographers are using the showroom for fashion shots and renting props. "Everything on the floor is for sale or rent."

Rentals are by the week—whether used for a day or a week. The charge is 10 percent of the list value for a piece of furniture; if the rental runs into a second week, an additional 5 percent is charged. On accessories, the 10 percent varies. Pick-up and delivery is up to the customer, who should be sure when the freight elevator is available.

A stylist, sometimes with an art director, will come to Jerry with a layout, or even a verbal description. They may be looking for an entire-room feeling or something like a small French desk. Because he has designed all the rooms, Jerry knows exactly what's available. Sometimes a good customer can handle the whole thing by phone. They know each other's taste, and are familiar with each other's descriptions. If he doesn't have the exact piece, he suggests something he thinks will work in its place. Don't come on a Saturday for rentals though; Jerry won't be there.

Living Plants

Treeman (797 Sixth Ave., N.Y.C.) flags people in from the street with a huge, flapping, cloth sign hanging out over the sidewalk—and right up there with "exotic plants" is "Rentals." Enter through one of two entrances. A dirt path horseshoes around under an arch connecting the two stores. It's like a sunlit jungle inside. Bright, airy, and stocked with plants from the sky above to the ground below. It is easy to see the plant you may rent or buy in this light.

Rental is usually 50 percent of the retail price from a day up to about a week. They'll rent to anyone—as long as the full value of the plant is paid up front. When the plant is brought back undamaged and smiling, the remainder will be refunded. If a customer wants to buy the same plant he rented, the rental fee is credited toward the purchase price. If he wants to buy a different plant, the rental fee doesn't count.

Anything in the store is for rent—waterfalls, baskets, pots, fountains, rocks, logs, wood chips, and marble chips—but more for a large

rental than a small one. Large rentals also have access to a maintenance service that replaces, cleans, fixes, and maintains their plants.

C. Kind & Co. Inc. Florists (137 W. 28th St., N.Y.C.) is right around the corner, as are lots of other "green thumbers." They charge one-third of the retail price per day for rentals. If you pick up a plant Wednesday, for use on Thursday, then bring it back Friday, that's one day. Three days (between pick-up and delivery), though, equals the price of the plant. Most photographers, they say, generally use the plants for one day.

C. Kind also rents white plastic-cylinder pots for 50 percent of the retail price per day. Other types of pots are available for purchase, as are cut flowers.

A full-color catalog listing their more than 100 varieties of plants also lists the heights, and light and watering requirements for each.

Cars

J. Morrison Better Cars Inc. (Baldwin, N.Y.) maintains two cream-puff classics and will get "almost any type you need if we have a little time to locate." The two on-hand show cars—a 1951 Ford convertible and a 1956 T/Bird convertible—as with any other car rented by them, is available with driver for about \$200 a day.

Talent agencies

Almost any kind of person or animal can be rented or hired from a model or animal agency. There are model agencies specializing in nudes, people-looking people, sports figures, midgets, giants, children, and the fashionable beautiful people we see all over.

Location management

A complete location service includes getting any sources and personnel the client wants, then managing them. A location is a place, other than the studio, where the photograph will be made. It could be an elegant city penthouse, a snowy mountain in August, or a medieval-looking castle.

A good location manager handles all the features provided by a good location service. A photographer calls him in, and

gives him a copy of the layout and a description of the general location. Snow in August, for example. The client wants a ski scene in the U.S. (The client, as is everyone else in this article, is New York based.)

The location manager calls the weather bureaus and Chambers of Commerce wherever he thinks there might be snow—Oregon, Colorado; Canada or Alaska if necessary. When he finds it, he asks the photographer, "Do you want me to scout it?" Scouting entails flying to the area and taking Polaroid pictures from which the photographer will make a selection. He may then go to the selected location, shoot it himself, and come back in a day or two. The location manager from then on might hire a free-lance staff (if the photographer doesn't have a staff), as well as managing the location and acting as first assistant.

A location manager has to have files of everything from wind machines to sailplanes. He must be able to produce good results faster and cheaper than anyone else. He does this by experience, knowing people, common sense, and "horse-trading." The farther from home, the more a mistake is compounded, so he must be aware of all the things that could go wrong.

The most unpredictable variable is weather. An aware location manager will call the local weather bureau of the location to find out not only the prediction for the week they'll be there, but what the pattern has been for the past few years. He may then decide to check with a secondary location. *Manos Angelakis* started his career as an assistant, then a studio manager, then became a location manager—his vehicle to learning location photography. Today he is a photographer. But photographers are not part of this story, so flash back to the good old days when large location business was booming.

"You have to know people," he explains. "All of it is word of mouth." From announcing that you're in business to bartering information with other people who know locations. Like a source exchange, sometimes you have people all over the country who can send you Polaroid pictures or even postcards of what a place looks like.



Peter Kaplan studying nature slides.



Ralph Dorazio playing.

SUMMER 1976

You collect location images, compile files in your head and on paper.

Once he had to find a place that had horses with English tack, a canoe, a dune buggy, and an estate with formal gardens all within an hour's drive from the city. Sometimes locations are rented, sometimes horse-traded. A guy with a beach house might not be interested in money (remember, these are the good old days), but might bite for a new barbecue. "The barter system sometimes works better than money."

Location finder

Someone who finds the physical locations is a location finder. No management is involved; although location finding is part of location management, location management isn't part of location finding. The location, in this sense, seems somewhat narrower—like a city garden, a swimming pool on a roof, a mirrored bathroom, a circular driveway, a beautiful commercial area, indoors with lots of daylight, or a shopping mall to be used in the winter for models in summer dresses. This would mean that attractive little corners were more important than expansive shots.

The location finder would research until he found an appropriate-sounding handful, then go and photograph them, and bring the pictures back to the client. Once a selection had been made, the location finder would take care of all the details and arrangements up to the shooting date: which days are convenient, dressing facilities, is there an electrical outlet for the electronic flash, can a van be brought right up to the entrance rather than park in the field, will the mall be clear of exhibits, etc. Ed Leach (Inc.) is a location finder. He calls himself (and son Dennis) "Research Consultants." Their "aim and objective is to satisfy the needs of the advertising media, to find the needle in the haystack." Whether people, places, or things.

A client doesn't always have a clear idea in mind. He may want to come in and browse through the files (for a fee). Ed Leach has color-print files (3x5s) of places and 2¼ contact sheets (8x10s) of "amateur" models. If a client uses one of the locations from the files, the basic browsing fee increases plus a percentage of what the person owning the property is paid. The categories depict libraries, bathrooms, antique autos, country roads, churches, castles, courtrooms, driveways, elevators, empty rooms, hospitals, gardens, gates, farms,

"Retouching makes beautiful models perfect, slim models slimmer; eyelashes can be thickened, skin smoothened, cracks in lips removed, jawlines changed, crooked teeth straightened, hands perfected, cuticles removed."

fire engines, and so forth.

For his amateur-model collection, he sometimes takes people off the street; sometimes they come to him by word of mouth; sometimes he photographs the proprietor of a property he's shooting for his location files. They are categorized by age and sex. Each holds a placard with his name and age, then goes through a set pattern for the twelve (2 1/4) exposures: a mug shot, a no-teeth smile, a toothy smile, right profile, right quarter profile—no smile, same with a big smile, looking back over the shoulder, for men a close-up of his hands/for women askance glance, anger, ecstasy, smug, and playful.

He stresses that he is not a model agency. A client might use an amateur model for spontaneous reactions as well as economy.

In "scouting" an apartment, he will shoot a 36-exposure roll of color print film. In addition to the obvious living room and terrace and view, he will also photograph the kitchen, bathroom if it's sizable, bedrooms, bar, and fireplace separately, and will ask about an attic and cellar. All these can be cross-referenced in his files. He may also photograph the people in the house for his people files.

He tells them what will happen, and what to do: I'm on your side. These pictures will be shown to a client. Only I know where this location is. If anyone calls you without my advising you that they will, talk to them, then call me immediately. General payment is made by my office for use of the premises. I pay you automatically out of my funds. So after your place is used, you call me, tell me that the place was used, whether you were paid by the user, etc. He leaves two copies of a location release for both the location owner and user to sign, then both keep a signed copy.

When a client goes to his office to look at apartment pictures, for example, they'll pick out the one they want to use. They tell him what they want to do, how many people are involved, and how much they want to pay. Mr. Ed, as he is sometimes called, takes it from there.

Location van

This can also be part of a location service, but not part of location finding.

A location van is a transportation and on-location facility. Usually a motor home, it contains all the facilities of a house—heating, air conditioning, kitchen, bathroom, dressing room for the models, sometimes a darkroom for the photographer. With a fully equipped location van, you don't have to leave the set.

Before these vans became popular, limousines and station wagons were used for location work. The crew still had to leave the set for meals, etc., losing valuable time and work flow. There just wasn't the same range of necessary conveniences.

Mystic Knights of the Sea Mobile Location Co. (One Christopher St., N.Y.C.) Phil Bleeth and Jim Jacobs have two such-equipped vans, which provide, in addition to the above: full-length closets, overhead and outside equipment storage, 110-volt power generator, 13-person seating capacity, extra-large refrigerator, and hot and cold running water. All this for only \$175 per eight-hour day, time and a half for overtime, free mileage in Manhattan, 12 cents per mile outside Manhattan, available seven days a week, all rates include driver.

Model maker

This is someone who makes a model of something that can't be bought in a store. It could be a replica that's scaled up or down, a simulation, or an exaggeration. Chances are that each job is different, so taking it as it comes is a challenge as well as an education to someone who does this. Just as a model maker is called on as a source, he in turn may call on artists, engravers, welders, jewelers, etc.

Brooklyn Model Works (803 President St., Brooklyn). John Kuntzsch and Mark Auerbach are part-time model makers, part-time architects, who build props and sets and models for exhibits and displays as well as for photographic purposes. Some of the things they've done include: a scale model of an oil rig with little helicopters, planes, and boats; a sales-projection "computer" with a control panel, lights, dials, flashing buttons, and men in space suits; a non-grainy, perfectly flawless plastic aspirin tablet; "dolls and other puppetry

creatures."

Ralph Dorazio (126 W. 23rd St., N.Y.C.) is a wood craftsman who does sculpture, furniture, teaches for a living, has built sets, makes wooden models, and can make *anything* out of wood. He has carved wood into: exact replicas of European road signs or intricate 10-foot lifeguard stands, stage sets where he has built wooden cherry trees that fall apart when hit with an ax and can be simply put back together again for the next show.

Free-lance assistant

is a photographer's assistant who works for a day rate; he is not on staff, but an independent who works when he chooses. Basically, an assistant loads cameras, sets up lights and electronic flash, sets up the seamless backdrop, answers phones, orders lunch, does darkroom work, and makes sure everything runs smoothly with the shot.

A good assistant goes further—he builds sets, can find locations, handles everything on location, finds props, leaves the photographer worry-free, and accumulates experience. If he has stayed an "assistant" long enough, he will have worked on so many jobs for so many different photographers, that he may know more than many of them. *Peter Kaplan* is such an assistant. He is a photographer who doesn't want a studio of his own. He photographs nature, and supports this pleasure by assisting. He is so experienced that he is actually a consultant.

On location, he takes care of all bookings—planes, luggage, cars—leaving the photographer and client free to concentrate on the shot. He checks out accommodations, makes sure everything is running smoothly, has all major credit cards, takes care of petty cash, taxes, etc.

"It's more than making sure that the photo is taken." He is always on the lookout—fixing hanging threads, feeding hungry models ("hunger shows in a photo"), oiling the unwieldy machine of photographic efficiency. "Sometimes you need four hands."

He finds locations, builds sets; has a fully curtained station wagon location van with a built-in sunroof and shooting platform that he rents to photographers



Manos Angelaskis viewing.



The Treemanias teaming.

(as long as he's included as assistant and driver); he rents all kinds of camera equipment; has a system for just about everything; is a compulsive camera cleaner (every night on location) and battery checker ("you gotta be . . . clean equipment is super important; most people don't think of it"). He is full of the tricks of experience—how to keep a head of foam on a glass of beer, how to photograph ice cream and keep it solid under the hot lights, how to maintain the "perfect sweat" on vegetables or glasses. "I've been around a long time and you pick up these things. Experience makes the difference."

Set builder

There are, of course, unusual sets such as a tropical shack (in a studio), a log cabin with an earthen floor, or a waterless underwater scene. But a lot of sets are standard room sets—two walls and maybe a window. A set builder can



Jay Ordan repping.



Thad McGar retouching.

be called in to do any of this, although sometimes it can be done by a good assistant. Whomever, it's done from the same old layout. A room set is comprised of three 4x8-foot panels that are put together. The window wall is so standard that studios that use room sets often have the panels already made up—with and without the window—ready to be put together in about an hour. Because wallpapering the walls is so tricky, sometimes a wallpapering specialist will be called in. A good assistant not only can build simple sets, but knows whether the wallpapering specialist is necessary and where to find him if he is.

Camera maintenance & custom equipment

Marty Forscher of Professional Camera Repair Service Inc., focuses his 30-year-old business around two aspects of commercial photography: (1) General care and maintenance of

equipment, which encompasses standard wear-and-tear problems, accidents such as dropped cameras, people who do a lot of shooting around water and beaches, or who go to the tropics and arctic and require special equipment care; fixing loose elements, cleaning, etc. (2) Making special devices to perform any and many functions, the aspect that seems to put the gleam in his eye. Simple things such as making mirrors that fit 45 degrees in front of the lens so that the camera doesn't face the subject its shooting—great for a hostile environment. Taking the lenses from one camera and adapting them for use on another. Building cameras for air-to-air freefall photography. Fabricating strip cameras—in which the film is constantly moving past an open slit so the pictures look as though they were printed on putty, then stretched. Wide-angle and motor-driven cameras before they were commercially available. Other projects with labels like NASA, Laser, and Calypso (a la Cousteau).

Given the time and the money, there probably isn't a photographic problem that Marty and his Professional Camera team can't solve.

Retouching

Retouchers are somewhat different from the other categories in this article: although there are independent free-lancers, there don't seem to be as many as in the other categories; they relate to and affect the photograph itself, not the making of it; they are generally hired by the art director, not the photographer; and may either be consulted in the beginning or resorted to at the end of the commercial photography process.

Jay Ordan of *Color Design Studio* and Shelley Clayman of *Welbeck Studio* were especially helpful in providing the insight and information for this section.

Retouchers are actually touch-uppers; retouching is actually the touching-up of a photograph. It's the process of changing a photograph to correct flaws or meet special requirements of the user. This is accomplished by artists called retouchers who affect the changes through the use of chemicals, paints, and dyes applied to the photograph as needed. A good retoucher needs to understand photography, illustration, and the technical skills to apply the illustrator's art to the photograph so that the end result remains photographic.

Retouching is a very meticulous skill

that enables an art director or a photographer to come closer to his original concept once he's seen the pictures. He may change the colors or even change the look of the picture, which may have been distorted in the camera. Retouching is a *tool* for the art director and the photographer to get the most flexibility from the photograph they have.

A matter of degree, the changes may range from minor spotting or speck removal to a major reconstruction: blue eyes can be made bluer, or even changed to brown; a V-neck striped shirt with necklaces can be changed to a round-neck shirt without necklaces (and even without stripes); a monkey in a cage at the zoo can be photographically transplanted to any jungle or any other background the user chooses; several pictures can be combined to look like one. Lighting can be changed, detail can be taken out or put in, dents can be taken out of cars or washing machines, highlights added. Backgrounds or scenery can be unbusied, brightened, dulled, or changed completely. Type on labels for example can be added or taken away.

Perhaps one place where we are most familiar with retouching, but may not be aware of it, is in cosmetic ads. Retouching makes beautiful models perfect, slim models slimmer; eyelashes can be thickened, skin smoothened, cracks in lips removed, jawlines changed, crooked teeth straightened, hands perfected, cuticles cleaned. Men whose beards photograph darker than they actually are can be lightened (makeup doesn't always work); several models with different skin tones in one picture are balanced—some lightened, some darkened. Stray hairs are done away with. Colors of lipstick, nail polish, and makeup itself can be adjusted or changed.

Why retouch? There are three basic reasons for retouching a photograph: (1) a shot is improbable-to-impossible to take; (2) impossible to re-take if something goes wrong; and (3) expense.

An *improbable-to-impossible* shot to take might, for instance, be one with the sun shining in a starlit nighttime sky. Or a clove, a strawberry, and a banana, all the same size in the same photograph. Or if something just isn't there—like putting trees where there were none, or covering a browned or muddied fairway with grass.

Some situations that might make *re-shooting* difficult might be:
—When the prototype of a new product

is only available once for photographing, any changes made in the photograph will have to be made by a retoucher; —Location photography often can't be reshot, so any changes become retouching changes. If the sun drops too quickly, for example, and the sky must be day-lightened, that's retouching; —if there's a shot that both the photographer and the art director like, but would like better with a change or two, rather than take a chance on losing the lighting or pose they already have, they can retouch.

A good retoucher is invisible. The better a retoucher is, the more invisible the work. The whole point is not to be able to see what they've done. It should blend evenly and uniformly into the photograph. There is no evidence of any style, and the more skill a retoucher has, the less you see signs of it.

Retouching breaks down into black-and-white, color print, and color transparency retouching. Both print and transparency require equal skill. In prints, all work is done on the print surface; that print will then be used for reproduction. In transparencies, the work is done on the transparency itself. If the format is smaller than 4x5, it will have to be enlarged. The larger it is, the easier to work on.

Color print retouching may be done on standard paper or dye transfer prints, depending on the job requirements. Most major color print jobs are done on dye transfer prints because they render colors more exactly, and accept extensive retouching. Because of this fact, they cost a lot more.

A dye transfer print is made from color separations. The colors, then, are really in separate layers *within* the print, which makes removing or reducing the specific colors possible without affecting the others. Transparency retouching employs many of the same chemicals and tools as prints, but is a very delicate operation, because it's being performed on the actual surface of the film. Chemicals and bleaches used at different temperatures for different time periods produce precise changes in the color balance and composition of the photograph. Areas may be completely removed, then restored with changes.

Some of the tools a retoucher uses are: palettes, brushes, cotton, tissues, razor blades, frisketing (masking) material, lightboxes, magnifying glasses, photographic sleeves (protectors for transparencies), dyes, and so forth.

A retoucher's background should preferably be illustration. An ability to

render realistically aids the ability of being an invisible hand that helps.

Permits

In the city of New York, it's against the law to obstruct the sidewalks. This includes setting up a camera on a tripod, working with a crew and model. It also includes *any* commercial photography, even if the camera's handheld. So a permit is needed allowing a photographer to shoot either in the parks or on the streets. There's a separate permit for each.

Mary Imperator, TV motion picture coordinator of the mayor's film office, is in charge of these permits. Not only about 2,500 still photography applications per year go through her office, but every feature, commercial, documentary, etc., filmed in the city. The permits are free, but must be filed.

Generally a photographer will keep a batch in the studio, then when he knows he'll need an in-city location, fills out the forms, sends them over with a messenger who brings a signed one back. The form is good for a particular date and location, asks about equipment, number in group, vehicles, time, etc.

There's a special police unit that helps out, too—blocking off streets, re-routing traffic, etc.

The invisible indispensable others

None of these people could do business without the invisible indispensables. The telephones, taxis, messenger services, answering services; renters of studios, darkrooms, equipment; camera and art supply houses; color and black-and-white labs. Their functions are as necessary as obvious, once you think about it.

And that's not even mentioning the photographers—who hold the whole thing together. *Morton Wax*, who I thought was a location finder but is really a publicity service for photographers, commented on "the high degree of integrity that photographers in the advertising field have." Because the photographer's name goes on the piece, and it lasts, the photographer might elect to shoot a job over again because *he* was unsatisfied, without the client saying anything, or even knowing . . . a kind of creative pride. That attitude seems to hold true for all of Photography's Partners as well. The next time you take a look at a commercial photograph, see how many of the Partners you can spot.

See what I mean about that elephant?



over the molding surrounding the glass in the window. By placing self-adhesive black foam weather stripping (Frost-King Self-Stick, $\frac{3}{4}$ -inch x $\frac{5}{16}$ -inch x 10 feet at your hardware store) over both molding and pine frame, a light-tight seal resulted.

Light leaks around all door edges were sealed using stapled (or tacked) Frost King No. 1400 weather stripping over cracks as required. The gap at the bottom of the doors were blinded with a weather strip of the type that has a flat metal upper half and a felt or rubber lower "sweeper"; it just screws to the bottom of the door.

I always recommend that, if at all possible, an enlarger be purchased with the longest girders available to facilitate the production of larger prints. Roberta chose a Beseler model 23-C and ordered the "BP" (girder extender) pack and larger baseboard. This baseboard is deeper than the closet counter, so we put nylon glides (same type as on chairs) under the baseboard; she only has to rotate the enlarger 90 degrees to stow it away. In 5 minutes the sink can be rolled out and trays set up, the enlarger turned around, tray siphon hooked up, and safelights turned on (they're Testrite $5\frac{1}{2}$ -inch round adjustable units with Kodak OC filters, permanently attached to the walls). It's a darkroom in which any professional would feel at home.

The designs shown here were optimized for each particular space, individual requirements, and personal preferences. Your space, your needs, your feelings about the "right way to do things" will influence your design—and that's the fun part. Obviously, the installation of a sophisticated lab requires skills in at least carpentry, and, depending on existing utilities, maybe even in electrical work and plumbing. How much you do yourself depends on how handy you are, and your ability to pay a skilled tradesman. If you are good with tools, certainly tackle the wood work yourself; if you get the large panels cut to size at a lumber yard, then all you need is a miter box and saw, electric drill, and the standard woodworking hand tools (and a router if you want to cover the wood with plastic laminate). If you decide to do the electrical work and/or plumbing, there are lots of do-it-yourself books on those subjects. Just make certain you thoroughly understand what you are doing, and observe all local building codes. 

In the early days of Carbon printing everyone used the same source—the sun; its highly actinic light affects the sensitized gelatin. They did not use the direct rays of the sun, however, because that would produce an over-hardening of the gelatin. Instead, they would place their printing frame in a north window and keep it there until the exposure was complete.

Arc lamps and mercury vapor lamps are highly actinic and can be used in making Carbon prints. Since these are not easily available at a low price, you can use a standard quartz lamp, which is used frequently as a movie light. These lamps produce rays in the red part of the spectrum and are not highly actinic; exposure times are longer with quartz lamps, but they will still do a satisfactory job. Because of the heat involved, it is best to place a small fan near the printing frame to keep the carbon tissue cool.

Set the printing frame 4 feet from the 650-watt quartz lamp and expose the negative for 4 to 5 minutes. This will be a useful starting time, but your negative may require a different exposure. After a few trial prints you will quickly determine which time is best. Since the sensitized carbon tissue is about three times faster than conventional printing paper, you might first want to make a test print on printing-out (red proof) paper and divide the time by three.

You will not see an image on the hardened gelatin, so there is no need to open the back of the printing frame to see whether you have had enough exposure. For this reason it is advisable to make numerous sample prints from a step wedge, and look these over carefully before the exposure. Judge what steps of the wedge correlate with your negative and expose the tissue accordingly.

4. Transfer

Once the carbon tissue has been properly exposed, remove it from the printing frame and place it into a cold water bath. The lights can now be turned on. In that same cold water bath should be your final transfer paper. It is a good practice to soak this paper while you are preparing for the earlier steps; it will be ready for use after 15 to 25 minutes, depending on the thickness of the paper.

Move the carbon tissue so that it is under the gelatin-coated side of the

transfer paper. Lift both of them together out of the water and let them drain. Place them onto a sheet of plate glass, at least 16x20 in size. Use a blade squeegee to remove all of the excess water from the combination. Carefully pick them up and place them onto a newspaper. Put wax paper over them, and then lay a second piece of plate glass upon the sandwiched tissue and transfer paper. The newspaper will absorb water from the transfer paper, which, in turn, will draw water from the carbon tissue. This creates a better bond between the transfer paper and tissue. Wax paper will keep the tissue from drying from its back side, while the glass adds weight, which will help to create a more secure bond. Leave this combination set for about 20 minutes.

5. Development

About 3 to 5 minutes before removing the glass from the tissue and transfer paper, prepare a tray full of hot water around 105 F. Immerse the sandwich into the water, making sure that all of the paper is covered; have the transfer paper on the bottom. Within seconds you will see the darkened pigment ooze from the sides of the sandwich; this indicates that the soluble pigment around the edges is beginning to melt.

Once the paper backing begins to separate itself from the transfer paper, lift it up by one corner and peel it off. You now have the transfer paper covered with a dark layer of gelatin. The longer it remains in the hot water the more the soluble pigment washes away. Gently rock the tray to help the water slowly remove the pigment, but do not rush the development.

You will see the image gradually emerge. Occasionally lift the print from the water and allow the water to run off. When the water that drains is clear and does not contain pigment, the development stage is complete.

At this point the swollen pigment image is very delicate; if you touch it with your fingers you may cause some of the pigment to separate from the paper. To harden the image and to remove the dichromate stain, place the transfer paper in a tray of chrome alum (3 gm of chrome alum dissolved in 1,000 cc of water). After 3 to 5 minutes place the print into a final water bath and then hang up by one corner to dry. Let the water drip for 5 to 10 minutes, then take it down and allow it to dry on a flat, dust-free surface.

Once dry, the print can be spotted, if necessary, and dry-mounted. Spotting is

easily done by using a small piece of tissue and soaking it in warm water; apply the pigment to the print with a fine-tipped brush.

Double transfer

What has been described is the single transfer method, but duo-tone, multiple-color, and tricolor carbon prints can be achieved by what is known as "double transfer." For this technique a temporary plastic (clear) support is used as the initial transfer paper. Once the various colored images have been developed on the plastic supports, they can be transferred to the "double transfer" paper. Each color is transferred individually and allowed to dry before another layer is added.

This method is simple and straightforward. Soak the double transfer paper for 15 to 20 minutes in a tray of water that is of normal room temperature, 68 F. Place the first plastic support into the cold water and bring it into contact with the double transfer paper. Lift them both out of the water and allow excess water to drain by holding them at one corner. Then lay them upon a plate glass and squeegee. Place a newspaper over them and add a sheet of glass on the newspaper; let this set for 10 to 15 minutes. Once the time has elapsed, hang the combination and let them dry. Gradually, the plastic support will release itself from the double transfer paper, leaving the pigment image on the latter.

A second image can be applied to the double transfer paper in the same manner as the first. The plastic supports are clear, allowing you to align the images visually; this is easiest if done over a light box. The number of colors or images that can be combined is unlimited, allowing great flexibility and creativity.

The plastic supports and the double transfer paper are available from Gallery 614. The plastic supports are numbered 107-S, and the double transfer paper is designated as No. 35.

Summary outline of Carbon printing

1. Make enlarged negative on Kodak SO-015 or similar film.
2. Sensitize the carbon tissue in a 3 to 5 percent solution of potassium dichromate.
3. Squeegee the carbon tissue to a ferrotype plate and allow to dry in the dark.
4. Put the negative and carbon tissue into contact printing frame and expose to light—sun, arc, quartz.

5. Place the tissue in cold water and bring into contact with transfer paper; squeegee excess water and allow to set under a sheet of glass.
6. Place this combination into tray containing 105 F water; remove paper backing when ready and develop image by allowing soluble pigment to wash away.
7. Harden image by placing print in cool water. Remove dichromate stain by soaking print in chrome alum.
8. Hang print and allow water to drain off. Lay on flat surface for complete drying.

Faults and remedies

1. The gelatin dissolves during sensitizing:
Either sensitizer was too warm or tissue was left in it for too long a time.
2. The image begins to slide from transfer paper during development:
There could have been an insufficient "safe edge" or the tissue could have been soaked too long before transfer. The transfer was not long enough.
3. The original paper support refuses to separate from the gelatin during development:
The print was overexposed. Use a hotter bath for development.
4. The print is too light:
Insufficient exposure.
5. The print is too dark:
Overexposure—use warmer water for development.
6. Blisters appear on the image during development:
Blisters are caused by air bubbles—insufficient squeegeeing.
7. Patches of irregular density:
The paper backing support was removed too late, protecting parts of the image from the warm water.

MATERIALS

The following materials are available from Gallery 614 for making Carbon and Carbro prints:

Pigment Tissues Monochrome

- No.
1 Warm Black
3 Deep Black
9 Blue Green
17 Brown (Sepia)

Tricolor

- No.
120 Yellow
121 Red
122 Blue

Single Transfer Paper (final support)

- No.
45 Double weight, white matt
48 Double weight, white canvas

61 Double weight, white linen

85 Double weight, chamois

Double Transfer Paper

No.

35

Plastic Temporary Support

No.

107-S

Non-supercoated Matt Bromide Paper

8x10

11x14

16x20

Producing a Carbro print

The Carbro process, like carbon, can be divided into the following five basic areas:

1. Enlarging—produce a silver bromide enlargement
2. Sensitizing—sensitize the carbon tissue
3. Chemical "Exposure"—squeegee together the carbon tissue and the bromide enlargement, allowing a chemical "exposure" to occur
4. Transfer—transfer and squeegee the sensitized and "exposed" carbon tissue to the final support
5. Development—place the combined carbon tissue and support in warm water and allow the soluble gelatin to wash away, leaving insoluble gelatin on the support as the final image

These areas will be dealt with in greater detail.

1. Enlarging

The beginning of a good Carbro print is a properly exposed and developed negative that has a full range of tones. A bad negative will produce a poor Carbro image, even though all of the steps are carried out correctly. The enlarging paper supplied by Gallery 614 comes in four grades, 1-4, so choose the grade of paper that corresponds to the contrast of the negative to be printed.

When making the bromide print, be sure that the border around the image is at least 1/2 to 1 inch in width. This provides a "safe edge" to keep the gelatin from separating from the transfer paper.

Make the enlargement on special, "non-supercoated" enlarging paper. The supercoating of most papers acts as a barrier that prevents the proper chemical hardening of the gelatin, especially in the thin layers that compose the light tones of the image. Certain high-contrast effects can be achieved by using Portriga-Rapid 118, but this paper will not give a full-scale Carbro print.

After exposing the bromide, develop

the print for 3 minutes in Dektol, LPD, or Amidol, the latter giving the best image. Following development, place the bromide in a stop bath and then into a non-hardening fixer. Any of the rapid fixers can be used as long as the hardener is not added.

Wash the fixed image for 30 minutes in running water. The print can be dried and used later, or it can be placed in a tray of cool water, 60 to 65 F, for immediate use. Place the final transfer paper into the same tray and allow it to soak. This will let the fibers of the paper stretch prior to use; otherwise, it will stretch while the transfer is being made. If the bromide has been dried, it should be placed in cool water for the same reason for about 15 minutes before being used.

2. Sensitizing

The sensitizer consists of a one-bath solution of the following chemicals:

Potassium Ferricyanide	16 grams
Potassium Dichromate	12 grams
Potassium Bromide	8 grams
Succinic Acid	2.4 grams
Potassium Alum	1 gram

These should be mixed in 1,000 cc of distilled water to make a solution of normal contrast. Diluting the chemicals in 1,250 cc of distilled water will produce a contrastier image, while diluting them in 750 cc will give a softer print.

The temperature of the sensitizer in the working tray should not be above 65 F or else the tissue will begin to "melt"; the best temperature range is between 50 and 60 F. Store the sensitizer in the refrigerator when not in use; allow it to warm up to the desired temperature while setting up for work.

Cut the carbon tissue a little larger than the bromide print and place the tissue into the same cold water tray containing the bromide. Once the tissue is limp, which should take about a minute, remove it and place it into the sensitizer. Be sure that no air bubbles cling to the surface, but if they do, use a cotton ball to wipe them away. The tissue should remain in the sensitizing bath for 2 to 3 minutes, the longer time giving a slight increase in contrast to the Carbro image. Gently rock the tray to insure that the tissue is always submerged in the sensitizer.

There is an alternative to the one-bath method of sensitizing. The chemicals can be separated into two baths, each bath giving some extra control to the quality of the print produced. There are numerous formulas concerning this two-bath procedure, and in the past

each Carbro worker had his pet formula that he used exclusively and perhaps secretly. A workable example is the following:

Stock Solution No. 1

Potassium Ferricyanide	50 grams
Potassium Bromide	50 grams
Potassium Dichromate	50 grams
Distilled water	1,000 cc

Stock Solution No. 2

Hydrochloric acid	30 cc
Glacial acetic acid	30 cc
Distilled water	350 cc

Working Bath No. 1

Stock Solution No. 1	120 cc
Water to make	480 cc

Working Bath No. 2

Stock Sol. No. 2	30 cc
Water	1,500 cc

Basically, the two-bath method consists of separating the potassium family from the acids. The control of contrast is to a greater extent determined by the amount of potassium dichromate used (as in carbon), while the acids will affect the thickness or density of the pigmented gelatin as well as the contrast.

The carbon tissue is placed for 2 to 3 minutes in the first bath; then it is immersed in the second bath for 30 seconds. The time in the second bath is variable; 30 seconds produces a normal-contrast print, while a shorter time produces a heavier and contrastier image. Conversely, a longer immersion, such as 40 seconds, will yield a soft print with little buildup of the pigment in the shadow areas.

The advantage of this method consists of the added control that is possible, but the disadvantage concerns the repeatability of the second immersion. Precision timing is necessary when removing the tissue from the second bath and bringing it into contact with the bromide. Any fumbling with the squeegee or the tissue will add precious seconds, causing a softer print than is wanted. If the procedure is standardized, however, the two-bath method affords the user much pleasure and control.

3. Chemical Exposure

Before the sensitizing time is completed, take the bromide print and squeegee it to a large piece of plate glass, 16x20 or larger. Squeegeeing the print will keep it from sliding as you bring the tissue into contact with it. Pour water onto the surface of the bromide in order to prevent the chemical reaction from taking place too soon.

Lift the carbon tissue from the sensitizer about 15 seconds before the full sensitizing period has elapsed and let it drain. When the time is completed, gently lay the carbon tissue onto the bromide print. Use one hand to hold down the combination, and squeegee firmly but not forcefully with the other hand. Squeegee first in an east-west direction, then north-south. The chemical exposure takes place instantly; if the tissue slides during squeegeeing, it is likely that there will be a double image in the final print.

Place a sheet of wax paper on top of the tissue-bromide sandwich and cover everything with a second sheet of plate glass; this will provide extra weight, making sure that the chemical reaction takes place on all parts of the tissue. Allow the sandwich to remain under the glass for at least 15 minutes.

4. Transfer

After the 15-minute chemical "exposure," remove the glass and wax paper and place the combined tissue-bromide in a tray containing cool water and the final transfer paper. Peel the carbon tissue from the bromide and place the bleached bromide into another tray of clean water, where it will be dealt with later.

There are now two methods of bringing into contact the carbon tissue and the transfer paper. The first is similar to what has been done in combining the tissue and bromide. Place the transfer paper onto the plate glass, cover it with water, and lower the carbon tissue onto it; then squeegee the two into contact and remove all excess water.

The second method is carried out under water; it is preferable and easier to deal with. When the carbon tissue is in the cold water, position the transfer paper so that its gelatin-coated surface is touching the sensitized surface of the carbon tissue. Lift these two from the water and allow the water and dichromate solution to drain. Do not worry about their sliding over each other, because the transfer does not take place immediately. After draining for 15 to 20 seconds, place this combination on the glass and squeegee. Squeegee firmly enough so that all the water is removed, but do not press too hard or else you will abrade the Carbro.

Gently lift this sandwich and place a newspaper or blotter on the glass; then lay the combination on the newspaper. The newspaper or blotter will absorb water from the transfer paper, creating a



+



Orbit Bath Added to Fixer is "O-FIX"

NEW "O-FIX"

TWO MIN. FIX TIME.

ARCHIVAL LIMITS
with 10 min. washing.

OB IS NON-TOXIC & BIODEGRADABLE

You can have an
odorless darkroom.

This Procedure is
DOCUMENTED.

You deserve quality prints
& it's about time.

Write TKO
Chemical Co. for free
brochure.

TKO CHEMICAL CO.
303 So. 5th St. • St. Joseph, Mo. 64501

What can YOU do about the technician shortage in the camera repair industry?

Become a camera repair technician. Make your interest in cameras pay with a profitable hobby or career. Learn at home in your spare time or at our resident school. For full details mail the coupon today — no salesman will call.

APPROVED FOR VETERANS TRAINING.



National Camera
Dept. AJC, Englewood, Colorado 80110

Rush FREE school catalog to:

Name _____

Street _____

City _____

State _____

Zip _____

☐ check here if expecting to study under GI Bill



National Camera
Technical Training Division
2000 West Union Ave. Dept. AJC
Englewood, Colorado, 80110

suction that causes the tissue to be pulled to the transfer paper. A more effective transfer takes place in this manner. Now cover the sandwich with wax paper and add the second sheet of glass.

The time of the transfer will vary according to the texture of the transfer paper. On the average, 20 to 30 minutes will be enough for the transfer. A very rough paper, however, may require up to 40 minutes for the pigmented gelatin to transfer.

During the time that the transfer is taking place, wash the bleached bromide for 15 minutes, redevelop it (in Dektol or whatever you use), and wash it again. In this way the bromide can be used to make four to five Carbro prints.

5. Development

About 5 minutes before the completion of the transfer, fill a tray with warm water at 102 to 105 F. Remove the glass and wax paper from the carbon tissue and transfer paper combination and place this sandwich in the warm water. Be sure that it is entirely immersed and that the tissue is at the top. Within 30 seconds the soluble pigment will begin to ooze from the surface between the combinations. Let this action continue, perhaps up to a minute, until the paper backing of carbon tissue begins to separate at the corners from the transfer paper. Gently lift one end of the backing and peel it from the combination. This wet pigment may be used later, so do not throw it away.

The pigmented gelatin will appear as a solid mass on the surface of the transfer paper, giving no hint that an image lies buried beneath the pigment. As this remains in the warm water, the pigment that is soluble will wash away. The pigment image is very delicate, so gently rock the tray or move the transfer paper back and forth; this will allow the water to remove the soluble pigment. As the pigment washes away, the image will appear and the "depth" can be seen. Occasionally, hold the transfer paper out of the water and let the water drain. When there is no longer a trace of pigment in the water that drains off, the development process is complete.

The next step consists of hardening the image and removing the bichromate stain. Use a solution of 3 grams of chrome alum in 1,000 cc of water; the water should be cool, around 50 to 65 F. Immerse the transfer paper into the "clearing bath" for up to 5 minutes, or until the yellow stain from the bichromate is eliminated. Another good

clearing bath consists of two parts, which are combined. The first solution is 3.5 grams of potassium alum mixed in 500 cc of water. When it is dissolved, add 50 cc of glacial acetic acid. The second bath contains 2 grams of sodium sulfite in 500 cc of water. When dissolved, pour the second solution into the first.

From the clearing bath, place the Carbro print for several minutes into one last tray of cool water. Then hang the print by one corner and let the water drain for 5 to 10 minutes. When the draining has stopped, lay the Carbro print in a flat dust-free area to dry. The image is still soft and delicate; make sure that it is placed face up. Also, do not let anything come into contact with the surface, such as a blotter or a piece of paper; this will remove the pigment.

NON-TRANSFER AND DOUBLE TRANSFER

What has been described is the single transfer method, whereby the pigmented gelatin is transferred once to the final support. Another method consists of developing the Carbro image directly upon the bromide print; in this case no transfer is necessary. To accomplish this, do not separate the combination bromide and carbon tissue, but place this sandwich directly into the warm water of 105 F. Peel off the paper backing and develop as in the single transfer. The final pigment image will adhere to the bromide print. Carry out the normal steps following development.

Once the print is dry, the silver image can be redeveloped or eliminated with Farmer's Reducer. A very simple duo-tone print can be made by redeveloping the bromide and using it as the substratum for another tone of pigment. For instance, the first image might be made using the green pigment; the redeveloped print can then be brought into contact with sensitized black tissue, and the result will be a green and black image. The black image can be softened by using the one-bath sensitizer diluted in 750 cc, whereas the buildup of the green pigment can be increased by using a 1,250 cc dilution. In this way the green will be strong, but the shadows will have the rich appearance of the black pigment.

The double transfer method employs a celluloid as the initial substratum for the Carbro image. When two or more Carbro prints are produced on their own celluloids and are dried, they can be transferred a second time to a final support paper. Duo-tone prints or

multiple-color prints are produced, but not as directly as the non-transfer method. The double transfer, however, is the basis of tricolor Carbro printing, so the technique should be mastered. In tricolor Carbro, cyan, magenta, and yellow pigments are developed on plastic carriers and then are transferred to double transfer paper.

Faults and Remedies

1. The carbon tissue sticks to the bromide:

Either the sensitizing solution or the bromide print were too warm, causing the tissue to melt.

2. The image washes off the final support:

The transfer was not long enough, or improper squeegeeing. If the wash water is too hot it will cause the pigment to slide. Insufficient border on print.

3. Small white spots on final print: Insufficient squeegeeing allowed air bubbles to be trapped.

4. Blotchy effect in sky areas: Squeegeeing was not done quickly enough. Possible hypo contamination.

5. Carbon tissue will not separate from transfer paper:

Allowed the transfer to set for too long. Try hotter water to remove the paper backing.

6. The print is too light:

Original bromide is too light.

7. Patches of irregular density:

The paper backing was removed too late, protecting parts of the image from water. Remove sooner.

References

Chambers, B., "Carbon Process," "Carbro Process," *The Encyclopedia of Photography*, Greystone Press, New York, 1963.

Focal Encyclopedia of Photography, Focal Press, London and New York, 1973.

Green, Dr. Robert F., *Carbro, Carbon*, Gallery 614, Fort Wayne, Ind., 1975.

Neblette, C.B., *Photography, Its Principles and Practice*, D. Van Nostrand & Co., 1927.

Wall, E.J. and Jorda, F.I., *Photographic Facts and Formulas*, American Photographic Publishing Co., Boston, 1947.

Wilson, Edward L., *The American Carbon Manual*, 1868, reprinted by Arno Press, New York, 1973.

EDITOR'S NOTE: Author Darryl Jones will be teaching a workshop on both these printing processes September 2-6, 1976 at the Maine Photographic Workshops. For further information, call (207) 236-4788.



SUMMER 1976

How to move in on a limb without going out on one.



Slide a 2x Soligor Tele-Converter between your 50mm lens and the camera and you've got a 100mm lens. Use a 3x with a 100mm lens, and you've got a 300mm lens.

At a fraction of the cost, the weight and the size of a telephoto lens.



And now Soligor Tele-Converters also come multi-coated. And they fit most SLR cameras.

The Soligor Tele-Converter:

we see it as the economical telephoto lens.

You'll see it as the window to a whole new world of picture taking.

Soligor Tele-Converters. Turns any lens into a telephoto lens.

Soligor



AIC Photo, Inc., Carle Place, N.Y. 11514

The Safekeepers.



Model PS 114
For Paper
Sizes up
to 11 x 14

Model PS 81
For Paper
Sizes up
to 8 x 10

Two New Paper Safes

Doors open with fingertip pressure for instant access and close automatically when released, eliminating accidental paper exposure. Adjustable shelf dividers let you store the sizes you use most. Printed labels show the location of different paper types and sizes within each safe. No more fumbling in the dark for the right paper. No more costly paper spoilage. Premier's moderately priced paper safes are a necessity in today's inflation-plagued darkroom.

Write for free literature to: Photo Materials Co., 500 N. Spaulding Ave., Chicago, Ill. 60624

Premier

PRODUCTS FOR PHOTOGRAPHY

New Sekonic Silicon Blue Meter System.

The Sekonic L-428 professional exposure meter system is designed to do more than any other meter. The silicon blue cell responds to high and low light faster and more accurately than ordinary CdS meters. Features include incident and reflected light metering, cell head rotates 300°, easy-to-read linear scales. Optional attachments for use as a spot, enlarging or cine meter. Other accessories for microscope and studio ground glass use. Under \$149.95



COPAL CORPORATION OF AMERICA
58-25 Queens Blvd., Woodside, N.Y. 11377
Tel: 212/672-9100

NEW! *GRA LAB*



Automatic Reset PRINTER/ENLARGER TIMER

Model 400 timer for multiple prints or production work has a 60 second time range for precise timing of a contact printer or enlarger. The automatic reset mechanism enables operator to repeat a selected time interval as many times as desired. Separate receptacles control printer or enlarger and safelight. Large 8" diameter luminous (phosphorescent) dial.

Order from leading photo dealers.
DIMCO-GRAY COMPANY
8200 S. Suburban Rd., Centerville, Ohio 45459

the year's best color!



1976 COLOR PHOTOGRAPHY

Here's the one magazine available today that combines great color photography with informative features. This latest edition includes 80 pages of the year's biggest and finest collection of full-color photographs. In addition to the instructive technical data on how the pictures were made, the issue is designed to help you improve your own color photography techniques with text and illustrations showing the inside workings of the professional color photographer's "best friend" — The Custom Color Lab . . . A 48 page 4-color section of portfolios from today's color specialists . . . Color Today — An analysis of the current state of the art of color photography . . . An exciting 21-page 4-color section of the year's best color photographs . . . The Early Years Of Color Photography: An interview with Leopold Godowsky. A 17-page 4-color section devoted to the magical color vision of Pop Photo's own Norman Rothchild. Add it all up and you've got the one publication that helps you learn more about color — and put more color into your photography—the 1976 COLOR PHOTOGRAPHY—the only magazine in the world devoted exclusively to color.

Color Photography, Consumer Service Division
595 Broadway, New York, N.Y. 10012 MME5U
Please send the 1976 COLOR PHOTOGRAPHY, I'm enclosing \$2.25 (\$1.95 plus 30c for postage and handling). Outside U.S.A., \$3.00 postpaid.
Residents of Calif., Colo., Fla., Ill., Mich., Mo., N.Y. State, D.C. and Tex. add applicable sales tax (postage and handling charges are non-taxable).
print name _____
address _____
city _____ state _____ zip _____

LETTERS continued from page 5

A super eye
A real nice guy
At SUNY and ICP.
A teacher, a writer,
With camera, few brighter.
We're just lucky that he can see.

So savor his writing
And stop all this biting
He never claimed his word the last one.
To the next fine review
Of the craft we pursue
I hope it's as good as the past one!
Janet Duhl Spector, Great Neck, N. Y.

Ah, Hecht

This is not intended to continue the "feud" between photographer Richard Misrach and critic Michael Edelson, but, rather, as a pointed evaluation.

That Misrach has suffered Edelson's slings and arrows is quite obvious. And whether or not the wounds inflicted justify the bleeding over the pages of your fine journal (*Spring 1976, Letters* section) any more than whether the critique belonged there in the first place is debatable.

What Misrach has yet to learn is that while creative art (any art) begins, not unlike a new human being, with delicate emotional process, the art-product resulting from such single parentage needs no parental protection once released into the world. (Providing, however, the parent releases such offspring after appropriate development.)

It is not my place (nor the place of any critic—amateur or professional) to judge whether or not Misrach's photographic children were committed prematurely to "the arena," because time only is the Purest and Truest of critics, and time alone rewards with recognition, or rejects with anonymity all that which we choose to label as art.

However, Professor Edelson, as a professional critic (if indeed there is any such thing) does not do himself proud by composing non sequiturs, such as, in referring to Misrach's "expensive hardcover book," he says, ". . . it sounds more like the photographer talking than a person." This supreme effort to split finer, an already split hair, in an obviously desperate attempt to separate Misrach the photographer from Misrach the person, is more than alarming. (I say alarming because one might easily conclude that this dual-personality standard of

measurement may very well be based on self-recognized traits, on which critic Edelson would measure all others.) Moreover, the use of critical license in straining to perform a post mortem on an artist still alive would indicate that Edelson's criticism of Misrach goes much deeper than is fair, but (and perhaps more urgent) that Misrach's images have triggered within Edelson, strange and perhaps abnormal conflict between his own artist/person personalities to a greater degree than he may realize, or care to admit.

What I am getting to is this: It matters not whether I like Misrach's pictures (which I don't). But it matters very much who Richard Misrach is and what he has accomplished. The *who* is answered in that he is a photographer of great skill. And his accomplishment, of course, is that in publication of *Telegraph 3 A.M.*, he has dared, by dropping all veils of pretension, to make honest, naked statements with his camera. Statements that we are all free to love, or hate, accept, reject, condone, or condemn—for that is our right and privilege.

The point is that boring or not, hostile or not, Misrach has committed to publication statements as he has seen through his lens as honestly as he knew how. And he has succeeded admirably. Whatever the outcome, his job is done. And I applaud him for doing his job and for nothing more. (I have already pointed out that I don't like his images.)

But Edelson has failed to do his job. And it is a difficult job to criticize. And it becomes more difficult still, when the practitioner has failed in his ability to isolate the ego personalities of the Photographer Person and the Critic Person within himself.

Simply, one *can* be an accomplished quarterback, Coach, and Referee, and while knowledge and experience in all three does provide high expertise in any one specialized job, one must nevertheless choose to wear one hat at a time.

Richard Misrach has made his choice.

And, when such time as Michael Edelson follows suit, the world of Photographic Art will be richer for it.

Donn Hecht, Miami Beach, Fla.

Notice to Readers

We consider it a valuable service to our readers to continue, as we have in previous editions of 35-MM PHOTOGRAPHY, to print the price set by the manufacturer or distributor for each item described as available at press time. However, almost all manufacturers and distributors provide that prices are subject to change without notice. Accordingly, prices are listed as furnished to us by the manufacturer or distributor. It may be possible to purchase some items in your area at a price that differs from the price that is reported in this Edition.

—The Publisher

photographed both male and female nudes and exhibited each in one-woman shows, finds that it is not that difficult; "it's easy if you're confident in yourself. If you're sure about what you want to do, and you don't have any misgivings, you can do it." To avoid being misunderstood, you have to explain what is on your mind. "For my female nudes, I went camping with a friend and we just decided to sunbathe nude. While she was sunbathing, I photographed her. The second model happened to have been a lifeguard at a place where I go swimming. She heard that I was doing female nudes and she approached me. Then I posed myself in a few (of the shots in her show)."

For the male nude, she first approached her brother-in-law who said yes, but whose wife, her sister, said an "emphatic no." Then she approached her younger sister, Faith, and asked her and Wayne Barrentine, her future husband, if they would mind if he posed for her. Another model heard she was doing those photographs, and approached her. Then she asked a weightlifter, who also works at the hospital where she is a medical photographer, if he had thought about modeling and would he pose for her. She asked like this: "I want you to understand that I am not coming on to you. I'm a professional photographer. You know I'm the medical photographer here, and I'm doing an exhibit on the male nude. I was wondering if you'd pose for me. He said yes."

If she feels there would be a problem, she doesn't photograph the person. "I asked around for both male and female nudes and whenever I decided it might be a tacky situation, I just decided not to do it.

"I think there are two basic types: there's the exhibitionist and the voyeur. Every photographer is a voyeur. I think actors and actresses are exhibitionists and people who want to be photographed fall into that category. I've posed in the nude. I feel much more comfortable being on the other side of the camera. I don't enjoy being photographed. I'm not an exhibitionist; I'm definitely a voyeur. I've found my niche in life."

Niccolini doesn't believe in shooting the two sexes differently, although they are not shot the same way in her pictures. "Both male and female nudes are part of the universe and we should

The Soligor 1° Spot Meter helps you think in shades of grey.

Do you want to expose for the bright part of a face and leave the rest in dramatic shadow? Or do you want a more even exposure based on the middle grey? Has a cloud just changed all your calculations? No problem. Because the Soligor 1° Spot Meter can

take readings of the smallest areas of your subject to get the exact exposure you want. All from the camera position. And the Soligor meter has tremendous range. It handles ASA's from 16 to 12,800. Covers stops from f/1 to f/128. With an EV range from 3 to 18. In two ranges. So if you have a Soligor Spot Meter you'll never be in a spot.

And we have other accessories to extend your vision. Soligor tele-converters let you get closer to your subject without buying expensive telephoto lenses. And our complete line of Soligor filters can change entirely the way you look at what you see.



Soligor

If you have the imagination, Soligor has the accessories.

AIC Photo, Inc., Carle Place, N.Y. 11514, In Canada: Kingsway Film Equipment Ltd., Ontario

The snapshot vs. the BIG shot

Big pictures are a winner projected on a Da-Lite screen

Little color prints don't compare with the big, bright picture you see when you project on a Da-Lite screen. Make your next pictures slides or movies and show them, lifelike and brilliant, on one of many sizes and styles of Da-Lite screens available. You'll wonder why you

ever settled for less. See your fine photo dealer or write for free literature.



DA-LITE

Da-Lite Screen Co., Inc.
Warsaw, Indiana 46580
Slide and movie screens
since 1909

If you own a Hasselblad, Mamiya RB67, Bronica, or Pentax 6x7...



Then you already know how much a telephoto lens would cost. The Komura TELEMORE series for Hasselblad, Bronica, Mamiya RB67, and Pentax 6x7 offers an alternative—a precision 2X Tele Extender that doubles the focal length of your lens at a fraction of the camera makers' lens prices. All Telemares are multi-coated with four elements, compact, easily installed, and have automatic coupling. New, special optical glass plus considerable research made the Telemore a reality. There is no other extender or converter quite like it.

Introducing the first professional tele extender ever made for 35mm... The new 7 element Telemore 95-II.



It's the new 7 Element Komura Telemore 95-II for 35mm. Even more exacting than its cousin, the 4 element Telemore 95, this new extender offers the kind of quality that users of fine lenses have demanded in supplemental lenses but were previously unavailable. It's 7 element configuration offers a high degree of color correction and resolution with a minimum of light loss. The Komura Telemore 95-II is multi-coated, and has automatic diaphragm coupling. They are initially available in Minolta, Nikon, Canon, and Olympus mounts.



feel comfortable about accepting them. I tried very much to get into the male body as I photographed it. It's just like driving a Cadillac today and a Ford tomorrow; it's a vehicle. If a person feels hung up about his body, it makes me feel uncomfortable. It doesn't really matter whether they are male or female. I think a beautiful male body is just gorgeous and I think the same about a beautiful female. It's a work of art. After having been a medical photographer for 13 years, after having seen all the distortions that a medical photographer sees, all the diseases, the crippling, it is really a treasure to focus on the possibility of seeing perfect bodies. I chose my bodies."

Although she is accepting of nude bodies, she isn't particularly interested in having other people around while she's photographing. When she shot her first female nude, she had an unexpected visitor. "We hiked for hours in the rocks of Maine and finally located what we thought was a desolate area. There appeared to be no one for miles around. We took our clothes off, walked down the rocks a little closer to the water, and I proceeded to photograph her. All of a sudden I felt eyes on my body and I looked up and above us was this guy looking down. I started ranting and raving like a maniac. He disappeared. Then I proceeded to photograph and again I felt eyes. I looked up and it was this guy again. This time I started chasing him like a banshee, without clothes and with this camera hanging around my neck. I must have looked like the most lunatic thing in the world, climbing up the rocks. I don't know what I was going to do to him. He disappeared. He panicked, and he never came back."

When she was photographing her future brother-in-law, her sister and he got very nervous about trying to be alone. They had gone to a human growth center in New York State, and had sneaked away to photograph. "It made Faith and Wayne very nervous. It wasn't comfortable for them because they were scared. I wasn't because I knew that even if I had been caught, that the owner would scream at me or something like that but he wouldn't throw me in jail."

Niccolini feels that the greatest outcome of her photography has been what happened between her and her sister, Faith. "A very special thing is what happened between Faith and myself and Wayne. Faith is young enough to be my daughter. We've

always shared an incredible closeness, but as a result of this, it was almost a revelation. Complete trust, complete love, totally nonjudgmental. Totally accepting. To me that was the highlight of the experience."

Niccolini feels that nude photography should be done for its beauty and not for anything having to do with sex; Patricia Grantz feels exactly the opposite. She is interested in doing erotic art that is truly erotic. Because she cannot relate to a picture of herself at all, she uses herself in pictures that some people would consider pornographic.

Most of her nude photography is an adventure into the examination of sex, sex roles, and eroticism. For them she uses her lover as model. He's accessible and willing.

She has been at photography for a number of years even though she is only 25. Grantz received her Bachelor of Arts and Master of Arts in Photography from the University of Iowa and taught beginning photography there for two years. She is teaching at New York University now.

While doing nude photography, she prefers to work one-to-one. At Iowa, she photographed models in classes, but there were too many people—she would get classmate-photographers in pictures, and wouldn't have enough control of the light. While working with someone she knows, it is easier to relax, she says.

She started her own nude photography in Illinois "in a funky hotel in an artists' community" where she and her lover stayed for four days after he had taught at a workshop there. She spent two whole days photographing. It was then that she discovered she wanted to learn what is and is not erotic.

The adventure was more exciting, perhaps, because the man she lives with is somewhat famous and she isn't sure that the pictures would be harmless. But he doesn't object.

It sometimes is not evident to the photographer or model exactly who will be shocked. As part of being good parents, many people feel it is necessary to teach certain fears to a child. These fears are not valid to the person as an adult, but he/she carries them over anyway.

I never had the guts to ask my parents what they felt about it; I can only hope that they do not object as strongly as I think they will. I suppose if they learn about my modeling, they will object, but I don't expect them to object to my photographing. However, I have never

sent them nude photographs I have taken—I guess I think they just won't look right hanging on the walls against the flowered wallpaper, amid pictures of us children taken while young, my diaper showing (what a portent of things to come), my sisters beaming for the professional photographer, my brother sitting in his rocking chair on the front lawn because by the time he came my parents no longer could afford a professional photographer. They wouldn't fit in among the pictures of Christ and the Thanksgiving turkey platter, or the medals long ago won for 4-H. They wouldn't fit in with the potbellied stove that I never learned to keep the fire burning in.

Sherri Smith, a professional nude model whose photograph has appeared on the cover of *Swank*, says her parents have been more understanding of the activity than she thought; she felt the world was going to fall in. "You think the worst is going to happen," she says. "I think fathers, more than mothers, with daughters (tend to react badly). It's like a daughter's getting raped or something. I think they're coming around to dealing with it now. They didn't see nude pictures of me when I was home because I hadn't worked that way. I was doing fashion shows and trade shows. Then when I came to New York (from Maryland) and did my first job, I knew it would be out on the streets in print and I was very excited about it, I was happy about it, and I said I better prepare them because they're going to see it. So I called them up, and I talked to my mother about it, and she said, 'Well, how much is showing?' She looks for me everywhere because she knows I don't tell her everything. She looks for me on paperback book covers. She says, 'I know that's your back. It's not that dirty; it's O.K.' My father sees what she brings home. He's sort of . . . he likes it, but he doesn't like it."

If the model likes his/her body, then other reactions shouldn't matter. Smith is proud of her body and appearance and it pleases her that she can appear nude on covers of magazines. But she is set against doing any pornography. She is interested in getting into films, but the offers so far have only been for pornography, because she's having trouble breaking into a union. "I guess that's a contradiction. I feel comfortable working nude in front of a camera, especially on assignment when there's a lot of people there, but I could never be comfortable in the other situation. I even have to turn the lights off when I'm doing

SUMMER 1976

What makes Paterson America's most popular darkroom accessory line?

More than a hundred great ideas.

The Paterson System: more than a hundred ingenious darkroom products. Most recommended by specialty dealers; most preferred by enthusiasts*.

Picture taking is only half the fun. Picture making allows you to exercise your full creative talents. So it makes sense to use the best darkroom equipment, if you're serious about your photography.

And the handiest way to get going is with the Paterson Developing Kit. It's a complete film processing hardware system in itself, with the famous Paterson fast filling tank and self-loading reel and everything else you need to bring the best out of your film.

From there, you can go on to the whole Paterson System: fine quality enlarger, Focus Finders for really accurate focusing, an ingenious Print Washer and all the rest.

For results you'll be proud of, put America's best selling line of darkroom accessories in your darkroom.

THE PATERSON
DARKROOM
25th Anniversary



For your free copy of the Paterson Beginner's Darkroom Guide, write Dept. 35P
Paterson darkroom products are marketed exclusively by
Braun North America, a division of The Gillette Company, 55 Cambridge Parkway, Cambridge, MA 02142.
In Canada, by Braun Electric Canada, Ltd., Ontario.

*Results of recent independent surveys of Photo Specialty Dealers.

it at home. I feel inhibited."

The first time Smith was photographed, she "didn't feel nervous about it. I felt nervous for the photographer because I was working with a guy who was still in school, and he was doing it for a class. I was thrilled he wanted to photograph me."

She met him at SVA. "I went up to apply for a job posing for the figure classes at the School of Visual Arts. And I met this guy out in the hall for a photography class. I felt like, 'Well, I'll try it with one person alone before I pose in front of a class.' And I started to work for figure classes, and I started to get pictures, and get my book together, and then I made the rounds, and I started working nude."

The first time she had no feelings of impending wrath of God, just worries about her parents' reactions.

Now she has stopped working at SVA because she is making more money elsewhere. Occasionally she suffers guilt feelings. For example: "One time I did get really nervous. It was weird. I was doing a cover assignment for *Swank*, and one of the people involved, his wife dropped by with their little son, who was about three years old, and the son sort of toddled by on the set. Then I got nervous, and everybody sort of laughed at me. I wanted to put a robe on; I felt funny in front of the child. The guys told me he was seeing his mother. 'He's not even looking at you anyway. He's more interested in the props in the corner to play with.' It just sort of freaked me out. All the grown-up people weren't bothered. I suppose it's because I've never been nude in front of a child before. All my conditioning came back."

Smith does get a lot of unwanted advances from photographers, but she is able to deal with them. Mostly these come about when she is working with a new photographer who is shooting her in exchange for prints for her portfolio. "I tell him I'm here to work."

Perhaps people would look differently at nude models if they actually knew how much work goes into photographing them. To get that carefree look, photographers and models work terribly hard. While on assignment, the model has to work for hours with the makeup person, the hair stylist, the art director. "When I think of people who look at the magazine, who look at the picture and fantasize a romantic setting with a lot of dirty, nasty things going on, if they could have been there and seen the two hours preparation, with all this paint on (the model's) face, they'd be totally turned

off," says Smith.

Perhaps as photographers, we should look at exactly what pornography is. It is art; it is switching a fantasy to something concrete. If it is done successfully; if it makes the viewer react in some way, then the intent is achieved. So many people do not want to venture into anything having to do with nudity because they are afraid of what the neighbors will say. Perhaps it is about time everyone looks at what (s)he has to say. And says it. 



VISUAL LITERACY *continued from page 19*

that they become ever more discriminating.

There are, of course, levels of enlightened skepticism, and some people have more of it than others. I would say that the most literate person would be almost totally skeptical but at the same time able to enjoy the offerings of the media and to carry on his life successfully despite his skepticism. There are, to be sure, a few people who develop no skepticism at all and who believe everything that comes to them via the media. This is to say that there are fools among us, as always, but it doesn't mean that the skepticism and literacy of the majority isn't developing at a great rate.

Arbitrary, or emotional, color

In discussing audio-visual literacy, something should certainly be said about color TV, because so many people are now glued to color TV sets. If millions of people are doing something, it can hardly be passed by.

The thing that stands out in my mind is how little people seem to care about what color they get on their sets. As long as it has color they seem to like it well enough. We could call it "arbitrary color." That is, the color of something in a TV image has a strictly arbitrary relationship to the color of that thing in everyday life. For example, a face on TV may come out green, magenta, blue, or brick red—and no one seems to mind.

I am tempted to call this an almost total breakdown in color taste in the American public, but that is too simple an answer. Furthermore, there are people highly trained in the visual arts who tune their color sets in the same highly arbitrary way. How can this be explained?

The main answer that I come up with is that the average person's color tuning may not be really arbitrary at all, though it seems to be. I suspect that what we are faced with is really "emotional tuning," that each person adjusts the knobs until the color is in tune with his inner emotional being, never mind that it then has a strictly arbitrary relationship to color in the real world. The fact that we see so much really gruesome color in other people's tuning could then be explained by the fact that the emotions being reflected (very accurately, I think) are essentially negative in nature—anger, jealousy, self-negation, etc. On the other hand, there are few people whose color tuning suggests that they have the inner being of angels. For example, on a set that Bob Black tunes ugly, Mary White comes up with color that is lyrical and beautiful—same darned set.

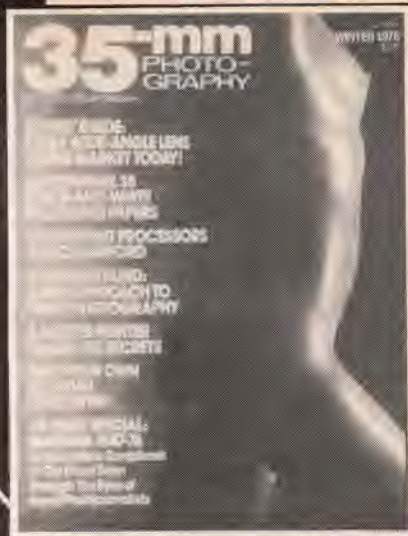
If I am correct in this, emotional tuning has already become an important part of the audio-visual language, a part over which the viewer has a large degree of control. It is his way of modifying the offerings of TV so that they fit him better emotionally, also his way of changing their meaning at will. The TV industry has made this development possible, though it certainly had no such thing in mind. It is a built-in capability of color TV sets, and there is nothing they can do about it now.

It seems likely that there are also people who do not tune their sets emotionally, but accept anything that comes on the TV screen, thinking that any color at all is better than none. They may unconsciously tune down their color perceptivity systems so that they aren't very aware of color, or they may learn to accept and even like its arbitrary relationship with colored reality.

And there must be some people who like arbitrary color because it constantly reminds them that they are looking at fictions, or human inventions, on their TV sets. This would surely tend to offset TV's ubiquitous sales pitch in the name of realism, common sense, and truth.

Whatever be the case, it seems certain that the public's experience with color TV has changed the way color now fits into the audio-visual language.

KEEP PACE WITH THE FAST-PACED FIELD OF 35MM...



With so much happening in this exciting field — with all the improvements in equipment and advancements in technique — you can't afford to fall behind. Not if you want to be an expert photographer.

How can you stay up-to-date? By reserving your copy now of the information-packed issue scheduled to be published in November, 1976. It's complete with articles that can sharpen your skills—with photographic examples of what you can hope to achieve—with announcements and reports on every technical innovation.

SPECIAL DISCOUNT AND ADVANCE RESERVATION OFFER FOR READERS OF 35-MM PHOTOGRAPHY

Reserve your copy NOW of the 1977 35MM PHOTOGRAPHY—Winter Edition at the SPECIAL PRE-PUBLICATION PRICE of only \$1.25, postpaid (newsstand price is \$1.95; mail order \$2.25). Complete the Advance Reservation Discount Form, enclose your remittance in the amount of \$1.25 and your copy will be mailed to you when published in November, 1976.

If you missed the 1976 Spring Edition published in March, 1976, it's still available to readers of 35MM PHOTOGRAPHY *only* at the SPECIAL PRICE of only \$1.25, postpaid (regular mail order price \$2.25). Just check the appropriate box on the order coupon and enclose your remittance. We'll see to it that it's mailed to you immediately.

Keep up-to-date all year long. Don't fall 1/1000 of a second behind.

35MM Photography
Consumer Service Div.
595 Broadway
New York, N.Y. 10012

☐ I'm enclosing \$1.25 (outside U.S.A. \$2). Please reserve the 1977 35MM Photography, Winter Edition—scheduled to be published in November, 1976. I understand it will be shipped to me from first-off-the-press copies when published.

☐ I missed the 1976 Spring Edition. I'm enclosing \$1.25 (outside U.S.A. \$2). Please mail my copy to me immediately.

Residents of Calif., Col., Fla., Ill., Mich., Mo., N.Y. State., D.C. and Tex. add applicable sales tax.

MM6SU

Total enclosed \$ _____

Print Name _____

Address _____

City _____

State _____ Zip _____

ADVANCE RESERVATION DISCOUNT FORM...

Omega's INVITATION to DARKROOM PHOTOGRAPHY

That's where the fun really is.

You and your camera. There's a special satisfaction you get working with it. Taking pictures with it. But if you're really serious about your photographic results it's time to get the total satisfaction of making pictures. Time to get into the darkroom with . . .

The Omega System 600

The ideal first enlarger. For all film formats up to 2 1/4" x 2 1/4". Choose Omega B600 with a high efficiency double condenser lamphouse for black and white or basic color work . . . or Chromega B600 with dial-in, professional-type dichroic filtration if you want the best in color. Modular design lets you change at any time. And priced to let you start with the best.



The Omega System 66

Let's you do even more with all negative formats up to 2 1/4" square. Choice of Omega B66 condenser lamphouse for black and white or color or Chromega B66 with professional dichroic color lamphouse. Choice of standard or extra long girder for enlargements to 16"x20" on extra-large baseboard. With modular system interchangeability.



The Omega Accessories

Enlarger easels. Color print processors. Reels and Tanks. Dryers. Timers (including digitals). Thermometers. Even a beginning darkroom outfit. All made by Omega to make it easier for you to get better darkroom results.

Get into your own darkroom. With Omega. Ask your authorized Omega Dealer to help you. Or write Omega Division, Berkey Marketing Companies, Inc. Woodside, N.Y. 11377.

 **OMEGA**
The Greatest Name in Your Darkroom.

Because of circumstance, fortunate or otherwise, color no longer means what it used to, not only in TV but in the other visual arts as well. As I see it, no other conclusion is possible.

To return to the subject of visual (or audio-visual) literacy: I should think that a literate person would tend to speculate a lot about color TV, what it's doing, why people accept the color they do, how perforce this must be changing the visual language, etc. In a sense, a literate person is one who is able to raise questions of this sort. The few raised here are just the beginning of all that are needed.

Well, what is visual literacy?

You may have noticed that I have been carefully skirting around the term "visual literacy," using mainly "audio-visual (or visual-verbal) literacy" instead. This is because I think that pure visual literacy does not and cannot exist. That is, there is no such thing as literacy without words—in the mind, in the ear, or on paper.

In order to have pure visual literacy, we would have to have some kind of visual language we don't think about, for thinking is a verbal process. It seems likely that such a language would also have to be created without thinking, which is preposterous. And how could it be taught to others without words?

My view is that every language must give rise to thought, or it cannot even be classified as a language. For example, if we wish to call still photography a language, we can do so only because still pictures give rise to thought (words in the head), thus making the *experience* of still photography an audio-visual one. Without the thought, without the meaning, still photography cannot function as language in any degree whatever. Meaning as such is primarily a verbal construct, and there is no getting around this fact.

Essentially, so-called visual literacy is the ability to think cogently about visual things, including human artifacts. Since thought is verbal and the things thought about are visual, the process as a whole is verbal-visual, the mind reacting intelligently to the perceptual intake of the eyes. If you like, you can say we are talking about visual literacy, but it is more accurate to call it visual-verbal.

It is true that people talk about non-verbal languages, still photography often being given as an example. However, they are only non-verbal to the degree that they are not, and cannot be, thought about. And if they are not to be

thought about, they don't qualify as language. Again, literacy of any kind whatever implies the ability to attach meaning to things. Thus, there is no way of being literate in an area in which both thought and meaning are absent.

My efforts to shoot down "visual-literacy" as a term may seem like nit-picking. However, it deserves to be shot down in the name of clarity, for it is erroneously used as a label for visual-verbal (or audio-visual) literacy. Pure visual literacy simply cannot exist.

Still photography

Keeping in mind that the main arena for the development of the audio-visual language is television, we will stay a while longer with still photography. As I said before, TV is apparently bringing people into still photography by the thousands and has prepared them well for expressing themselves in this medium. Since most of my students in the last 10 years have been in this category, I have had contact with hundreds.

We will now go back for a moment. There was a time when still photography would have qualified as a non-verbal language, if a language were actually possible without words or thought (words in the mind). As I said earlier, people used to find it very difficult or impossible to think or talk about photographs, except perhaps to describe how they were made. This includes both non-photographers and experienced photographers.

However, instead of calling still photography a non-verbal language (the very term is suspect), I will say that it was mainly in a pre-linguistic, or proto-language, state. We could thus say that it was a language about to become. Through the years, the structure of the language developed in good shape, no doubt of that, but no one knew how to read it. That is, no one knew how to read photographs, or how to attach meaning to them. They were puzzles that no one knew how to solve. Fortunately, a rather small group of people, many of them teachers, set out with great determination to solve these terribly frustrating puzzles, i.e., to translate their meaning into words and thus complete still photography as a language form.

At present, these people and former students of theirs are spread throughout photography's entire educational establishment, well prepared to continue the arduous task of learning to interpret photographs and further the

FREE INFORMATION CENTER FOR PHOTO PRODUCTS

STILL CAMERAS

- 1—The features of the compact Leica CL are explained in a four color brochure available from E. LEITZ INC.
- 2—40 page color brochure describing the Leica SL2 and Leicaflex system, including the motorized Leicaflex SL2. E. LEITZ INC.
- 3—Descriptive color leaflet and 12 page brochure on the all new Minox 35EL the world's lightest 35mm camera. MINOX USA, DIVISION OF E. LEITZ INC.
- 4—40-page full color brochure and price list feature and describe the Minolta XK, SE-7 and XE-5 electronic 35mm single lens reflex camera system, full line of accessories and Minolta systems of interchangeable lenses from 7.5mm fisheye to 1600mm telephoto. MINOLTA CORP.
- 5—Informative kit features the Minolta SR-T System of 35mm single lens reflex photography. Includes 36-page full color brochure and price list featuring Minolta SR-T 202, SR-T 201 and SR-T 200 cameras, Minolta SR-T accessories and Minolta lenses from 7.5mm fisheye to 1600mm super-telephoto. MINOLTA CORP.
- 6—Data kit covering Minolta 35mm automatic cameras. Full color brochures and price list feature the Hi-matic E, Hi-matic P and Hi-matic G. MINOLTA CORP.
- 7—Modern Photography's results of studying the GAF L-ES Electronic Single Lens Reflex Camera. GAF CORPORATION.
- 8—A brochure describing GAF 35mm single lens reflex cameras and accessories (GAF L-ES, GAF L-CS, GAF L-CM, various lens and film). GAF CORPORATION.
- 9—A full color brochure describing the full line of GAF 35mm cameras (GAF L-ES, GAF L-CS, GAF L-CM, GAF MEMO 35EE) GAF CORPORATION.
- 10—Miranda color brochure, illustrating the Miranda EE and RE11, with features and specifications. AIC PHOTO INC.
- 11—New Miranda DX-3 described in detailed, colorful brochure, listing features, specifications and accessories. AIC PHOTO INC.

STILL CAMERAS

- 41—Honeywell Announces Your Next Camera. This brochure lists all the features and advantages of the complete Pentax 35mm camera system. HONEYWELL.
- 42—Brochure on the Honeywell Pentax 6x7 system, is a full color brochure with information on the complete system, 6x7 lenses and all accessories. It includes specifications and benefits of the 6x7 format. HONEYWELL.

LENSES

- 14—Soligor T4 auto, fixed auto, preset and zoom lenses fully described in colorful brochure, including detailed specifications. AIC PHOTO INC.
- 36—Informative free booklet describing 50-125mm f/4 Macro-Zoomar lens. Technical information and mounts available. ZOOMAR, INC.
- 43—Brochure on the Honeywell Lumetax Mirror Telephoto Lens. The mirror lens is compact, light weight and is available as a 750mm f/6 or 1250mm f/10. The lens can be used with almost any 35mm SLR camera with a T Adapter. HONEYWELL.
- 50—A 60-page full-color brochure—easy handling. Illustrating Prinz Lenses and Filters. Each described with detailed description, specifications and performance illustrations. Also includes a full line of accessories for lenses and filters. AMCAM INTERNATIONAL INC.
- 51—A new beautifully illustrated four-color brochure on the remarkable Prinz Multi-Coated Lenses. It contains a wide variety of Multi-Coated Lenses of Varying speed and focal lengths—in both telephoto and wide-angle. Each lens with detailed description, specifications and colorful illustrated focal length comparisons. AMCAM INTERNATIONAL INC.

MOTION PICTURES CAMERAS

- 12—24 page four color brochure describing the features and technical data on the Leica Special movie camera. E. LEITZ INC.
- 13—A full color brochure describing the complete line of GAF Super 8 single-system sound cameras, sound projectors and accessories. GAF CORP.

A library of useful information is available to photographers free, thanks to the instructional literature many manufacturers offer. There are, no doubt several booklets described here that will interest you. You can circle as many choices as you wish on the coupon below. Mail directly to 35mm PHOTOGRAPHY. Your requests for literature will be forwarded to the manufacturers concerned.

LIGHTING EQUIPMENT

- 15—Minolta Auto Electroflash 450 and Auto Electroflash 280, brochure and price list detailing operation of these high-power, auto-exposure, electronic flash units and accessories. MINOLTA CORP.
- 16—Soligor Electronic Flash units described in detail, with complete specifications. AIC PHOTO INC.
- 44—Brochure on the Honeywell Pentax 1"/21" Spotmeter. The Spotmeter is ideal for determining exposure under difficult lighting situations. It has a 1° measuring angle you view at 21°. It's extremely accurate and easy to use. HONEYWELL.
- 45—Two brochures on the Honeywell Strobodome. One is on the compact, powerful Honeywell 380S and 480S Auto/Strobodome with fast, energy saving circuitry and the unique shoe-mount Strobodomes. HONEYWELL.
- 46—Honeywell Strobodome Electronic Flash Guide. The Flash Guide has a brief history of electronic flash, how it works, and includes complete details and specifications on the current line of Honeywell Strobodomes from the small Strobolite 18 up through the professional Auto/Strobodome 890S. It also includes a listing of the accessories available for Honeywell Strobodomes. HONEYWELL.

PICTURE TAKING ACCESSORIES

- 17—Tips on tripods brochure from Soligor/Quick-Set complete with recommendations on types of tripods and benefits from usage of tripods on all types of tripods equipment. AIC PHOTO INC.
- 18—Pamphlet describing the Tiltall tripod; its quality features and also unique story of its history. E. LEITZ INC.

PROJECTORS, SLIDES & SCREENS

- 19—Four color brochure on Leitz Pradovit projector describing the Pradovit Color 150 and 250, plus Auto-Focus models. E. LEITZ INC.
- 20—Full color brochure and price list outline the operation of Minolta Autopak AFT/2 and Autopak AF/ auto-focus slide projectors. MINOLTA CORP.
- 21—Projection Screen Selector in a colorful folder presents complete line of Da-Lite Slide and Movie Screens, shows what size to choose. DA-LITE SCREEN COMPANY.
- 22—Brochure describing Automatic Electric operated slide and movie projection screens, giving information on all sizes. DA-LITE SCREEN COMPANY.

DARKROOM EQUIPMENT

- 23—Free catalog describing 35mm film, supplies and equipment for do-it-yourself 35mm processing. SUPERIOR BULK FILM CO.
- 24—Ethol Chemicals offers free technical bulletins on complete line of film, paper and X-ray developers. Also bulletin on agitation and a brightness range chart. ETHOL CHEMICALS INC.
- 25—Premier Equipment Catalog lists over 70 items available for Darkroom use. PHOTO MATERIALS.
- 26—Brochure lists a compact, low-cost color print processor capable of processing 14 8x10s at one time. PHOTOGRAPHIC INSTRUMENTS CO.
- 27—Soligor/Jobo introduces the "darkroom source". Tanks, reels, film loaders, washers, graduates, paper safes, etc. Amateur and professional equipment for processing black and white or color film. AIC PHOTO INC.

- 28—Full color brochure and price list describe operation of the Minolta Color Enlarger System. Including filter-drawer module, dichroic filter module, color analyzer and accessory system. MINOLTA CORP.

- 29—32 page illustrated and descriptive darkroom catalog. BOGEN PHOTO CORP.

- 38—Discover Ilford Black and White is a multi page brochure describing Ilford black and white film, paper and chemistry. ILFORD INC.

- 39—Cibachrome Take One describes the new 3 step direct-positive system for making color prints from slides. ILFORD INC.

- 40—Ilfospeed Brochure describes the 4 minute print system for resin coated paper, chemistry, and dryer. ILFORD INC.

- 47—It's easy to... Develop Your Own Color Slide, Make Prints from Color Slides, Develop Your Own Color Negatives, and Make Prints from Color Negatives are four new brochures available from Unicolor. Each brochure covers what you need, how to get ready and takes you step-by-step through the particular process. UNICOLOR DIVISION.

- 48—Two informative bulletins. One describes Archival Print Quality and the new "Four and One" hypo eliminator. EDWAL SCIENTIFIC PRODUCTS CORP.

- 49—Brochure on new procedure "O-Fix". Add Orbit Bath to fix. You only fix for 2 minutes instead of 10 minutes with 10-15 minutes wash you will obtain archival results. TKO CHEMICALS.

- 54—Brochure on new Galab Darkroom Timer. DIMCO-GRAY CO.

MISCELLANEOUS

- 30—"Photography Books from Kodak" (L-3). A color booklet describing over 100 up-to-date publications for picture-taking and darkroom techniques for amateur, advanced amateur, and professional photographers. Includes prices. EASTMAN KODAK CO.
- 31—Full color brochure describes the full line of Minolta/Celnic Binoculars, including Pocket, Compact and Standard models. MINOLTA CORP.
- 32—Technical booklet printed in full color, explains Minolta's line of professional exposure meters. Includes Auto-Spot 1° TV, Flashmeter and Autometer Professional. MINOLTA CORP.
- 33—Give your GAF 500 Color Slide Film a Push to 1000 ASA. GAF CORP.
- 34—New 36 page brochure on enlargers, darkroom items, tripods, unipods, lighting equipment, copy stands and lights, illuminated slide copier. TESTRITE INSTRUMENTS CO.
- 35—12 page color brochure describing features of the all-weather Trinovid binoculars, including leaflet on the new compact mini-size Trinovid binoculars. E. LEITZ INC.
- 37—36-page fully illustrated catalog of Bushnell products including binoculars, SLR lenses and telescopes and the following brochures: "SLR Camera Lenses" and "How to Use Your New Space-Master as a Telephoto Lens" as well as our Bausch & Lomb Discovers Telescope for Telephotography. BUSHNELL OPTICAL CO., DIV. OF BAUSCH & LOMB.
- 52—Nikon School of Photography, a 10½ hour, 1½-day, intensive course in SLR Photography, fundamentals through special effects. Brochure includes 1976-1977 semester schedule of dates and locations, details of program and registration form. EHRENEICH PHOTO-OPTICAL INDUSTRIES, INC.
- 53—Nikon Owner's Course, a 4-hour basic course in the operation and effective use of current Nikon and Nikkormat cameras. Brochure includes details of program, schedule of locations and dates for 1976, and registration form. EHRENEICH PHOTO-OPTICAL INDUSTRIES, INC.

TO: 35MM PHOTOGRAPHY • P.O. BOX 2914 • CLINTON, IOWA 52732
VOID AFTER DECEMBER 28, 1976 35 76 SU

NAME

(Print Clearly)

ADDRESS

CITY

STATE

ZIP CODE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54			

development of the audio-visual language, of which still photography is now an important part. Almost without exception, their students have been taught the essential workings of the language by television, though this may not have been the intention of the TV industry. They are "TV's Children," the first products of the so-called Visual Age.

Unlike their forebears, these young people find it relatively easy to think and talk about pictures, especially when helped by people well prepared to lead them. After all, they already have an intuitive idea of how the whole audio-visual language system works from their TV experience. Thus, they are ready to bring their intuitions up to the level of consciousness and *really* see how the language works. In so doing, they raise their own visual-verbal literacy level at a very rapid rate.

There are many who don't have teachers, of course, and I have less experience with them. However, the ones I have met seem to be doing very well on their own, for they have been well taught by that gigantic teaching machine, the television industry. After watching the new language in action for many years, it is no wonder that they have more or less figured it out. These people, too, seem to have little difficulty in thinking and talking about still pictures. And they have no difficulty in accepting the concept that the experience of still pictures is a visual-verbal process.

I'm not sure why TV has lead so many people into still photography, but I have some ideas on the subject. For one thing, the move into stills may be defensive. Finding that TV has trained them mainly as receivers of communication, people may find themselves psychically out of balance and unduly at the mercy of TV's ever-present sales pitch. By becoming also *initiators* of communication, they perhaps restore the balance and develop insights to insulate them against the pitch.

One thing is certain: still photography is an excellent instrument for helping one analyze a large percentage of the tricks, or visual-linguistic devices, that are so effective in TV. This is because the difference between still and motion photography is not really all that great. A *trick that will work in one arena is just as apt to work in the other*. Once one has personally tried one of these tricks, or graphic communication devices, thought about it deeply, and tried it on his

friends, he is in a good position to know why people, including himself, are affected by it. Thus he is also in a position to view it objectively and with discrimination, controlling its effect upon himself at will.

One could say that people go into still photography because they wish to improve their audio-visual literacy, but few really give a damn about their level of literacy. In this case, heightened literacy, marked though it may be, is mainly a by-product of some other pursuit, for example, the effort to understand a language form better that has had a powerful effect upon one's

**I'm thinking
now of all the
electronic
garbage one has
to put up with if
his set is less
than perfect
and sometimes
even if it is in
excellent shape.**



life. Indeed, many people may even find such an understanding a dire necessity. It wouldn't surprise me in the least.

A more obvious reason for this migration into still photography is that from their years of TV experience, people have been able to see rather clearly how they could adequately express themselves in stills. Coupled with this is the fact that many of the traditional forms of self-expression are assuming a relatively minor position in the culture.

One would think that TV's children would normally enter into TV or film production in their efforts to take command of the language that has influenced them most in their lives, and it is true that many of them do. However, TV and film production are such expensive propositions that many schools and individuals simply can't afford them. Furthermore, they are of necessity group activities, which many people don't like, especially the intolerant young. Thus we find an ever greater number of people turning to still photography, because it works quite well enough in helping them understand how the whole American audio-visual language structure works. Also of importance, they can use it to express themselves as fully as they wish.

One thing that is rather certain in my mind is that the visual-verbal-minded people coming into still photography will rapidly raise the level of their own audio-visual literacy and eventually have a similar effect on the population as a whole. When you have a sizable group of people who actually know what to think about all the things they see and hear, it can't help affecting the entire culture. My guess is that this effect is already progressing at a rather rapid rate. And I remind you that, intentionally or not, the television industry is behind it.

Conclusion

The idiot box has done much more to the American culture than most people suppose, partly because so few people have even suspected that it was capable of it. One of the effects has been the indoctrination of the entire public in the ways and means of the audio-visual language. Now, in ever-increasing numbers, people are moving to take personal command of this language as initiators of communication, many of them turning to still photography for this purpose. For such reasons, the audio-visual literacy of a significant percentage of the public is beginning to surge ahead at a logarithmic rate. 

SOMETIMES YOU NEED AN AUTOMATIC CAMERA YOU CAN MANUALLY DISAGREE WITH.

There are times when a "perfect" exposure is all wrong for what you have in mind. But how is your automatic camera to know that?

Can you argue with it?

With the Konica Autoreflex, you can. And you always win automatically. (Or *un*-automatically.) Because Konica Autoreflex is really two cameras in one. It's both the finest automatic *and* manual camera you can own.

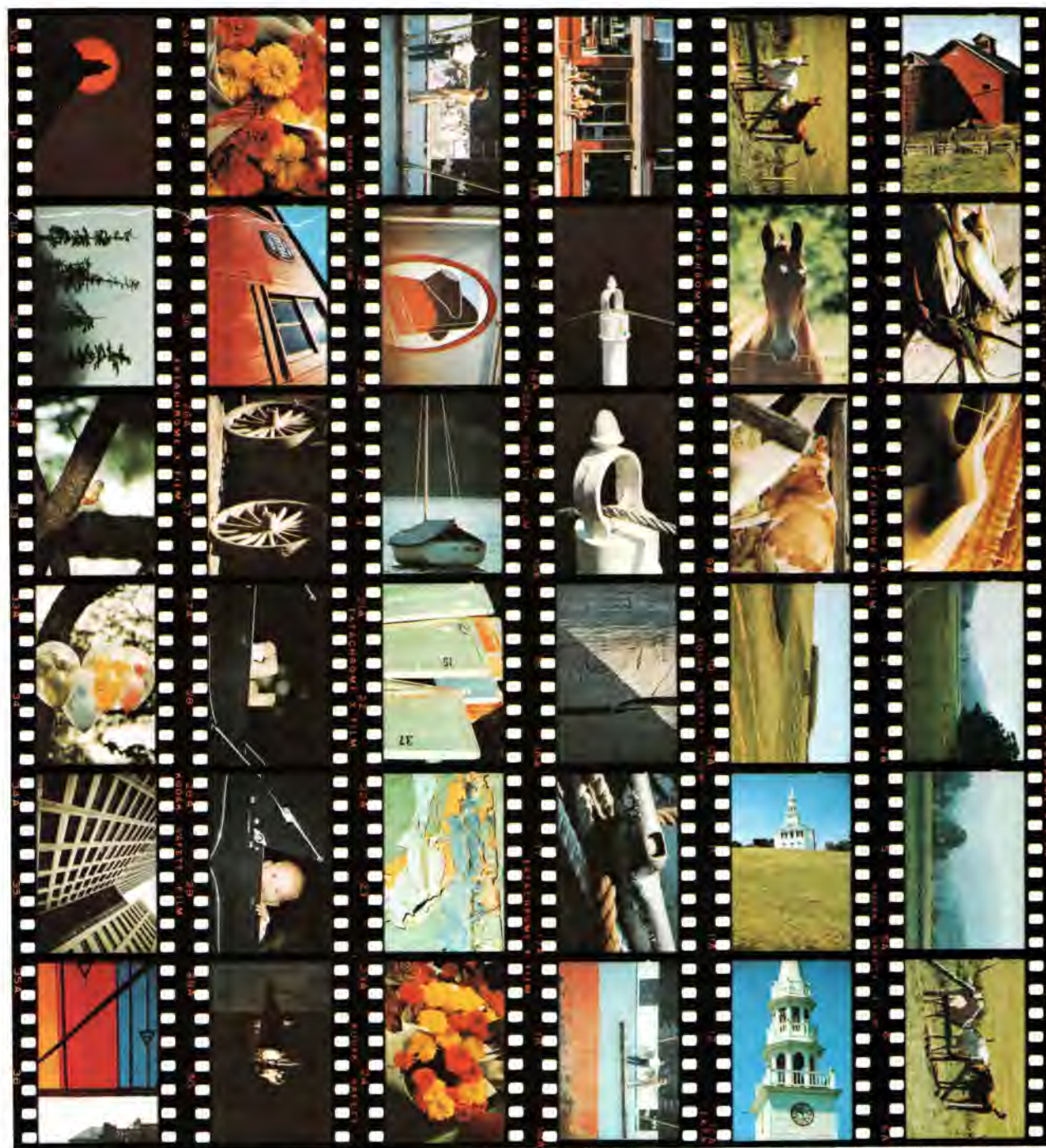
A fully automatic, professional camera when you need it to capture those shots that are here one split-second and gone the next.

A manual camera when you want it your way. For those special effects you see in your mind's eye. For tricky or deceptive light conditions. For deliberate overexposure or underexposure. Shots through extension tubes or close-up bellows. For all those situations that inspire your creative urge to do it differently.

When you want to concentrate on photography and not on manipulation, use the Konica Autoreflex.

When you want to manipulate the exposure the way *you* want, use the Konica Autoreflex. It's the best two cameras you can buy. Automatic *and* un-automatic. For a demonstration see your Konica dealer.

Or write for literature to: Konica Camera, Woodside, New York 11377.



See opposite page for exposure details.

KONICA AUTOREFLEX: Automatic and un-automatic.

NIKON OWNERS COURSE

A 4-hour orientation course for new Nikon and Nikkormat owners.

The purchase of a Nikon or Nikkormat camera is a major event in any serious photographer's life. Often, it's the fulfillment of a dream, the entrance into a whole new realm of photographic possibility. We feel a responsibility to help Nikon and Nikkormat owners realize all the potential that is there, waiting. So now, exclusively for the Nikon family, we are pleased to offer an orientation course dedicated to the cameras themselves, a course of particular value to **new** camera owners... **The Nikon Owner's Course.** It delves into all the controls on your camera, and how to get the most out of each. It explores some potentials which may be new to you, even if you've been taking pictures for years.

An advanced multi-media presentation, liberally illustrated with exciting and effective photography, the course is filled with useful information about your camera. Exposure control receives heavy emphasis... you'll be ready to meter accurately in almost any imaginable lighting, when this section is completed! You learn how to use shutter speeds to achieve the effects you want. The differences between various types of lenses, what effect varying lens apertures has, the perspective magic that lenses put at your command. You'll find the best ways to hold and handle your camera, even how to clean and maintain camera and lenses! What's more, when you attend the course you will receive a useful Notebook/Workbook filled with valuable information to help you grow in photography.

Admission... only \$10

To attend the Nikon Owner's Course, you must purchase your admission ticket by mail directly from Nikon, Inc. Send \$10 with a completed Nikon Owner's Course Registration Form which is available at authorized Nikon dealers.

Free... with a camera purchase

If you buy a new Nikon or Nikkormat camera anytime between January 1, 1976 and December 31, 1976, you can get your \$10 admission ticket FREE. Instead of sending \$10, just enclose a copy of the bill-of-sale from the camera you purchased, along with your Nikon Owner's Course Registration Form. This free offer is made **only in the United States** on retail sales of new Nikon and Nikkormat cameras imported and sold by Nikon, Inc.

The Nikon Owner's Course will visit over 150 cities around the country. It will be four hours of concentrated instruction, lasting from 6:30 to 10:30 on a weekday evening. Your Nikon dealer has schedules, details, locations and registration forms. We suggest you bring your Nikon or Nikkormat camera when you attend the Nikon Owner's Course.

"Graduate" to Nikon School

The Nikon Owner's Course is the perfect prelude to The Nikon School of Photography. This famous 11-hour school, now in its sixth year, takes your new-found camera-handling skills and puts them to work making good photographs. Practically any imaginable photographic principle and technique is clearly explained and illustrated by highly qualified photography instructors. From basic essentials such as composition to sophisticated techniques like multiple exposures, you'll come away with knowledge and inspiration to make your own photographs. The Nikon School is open to everyone, at just \$30.

Ask your dealer for travel schedules and locations for The Nikon Owner's Course and The Nikon School... or write for Lit/Pak 10.

Nikon Inc., Garden City, N.Y. 11530.

Subsidiary of Ehrenreich Photo-Optical Industries, Inc. 

*Also available in Canada from Anglophoto Ltd., P.Q.

